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Health Care Financing

Research Report

End Stage Renal Disease, 1986

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Health Care Financing Administration

Health Care Financing Research Report

The Health Care Financing Administration (HCFA) was established to combine health financing and quality assurance programs within a single agency. HCFA is responsible for the Medicare program, Federal participation in the Medicaid program, and a variety of other health care quality assurance programs.

The mission of the HCFA is to promote the timely delivery of appropriate, quality health care to its beneficiaries — approximately 50 million of the Nation's aged, disabled, and poor. The agency must also ensure that program beneficiaries are aware of the services for which they are eligible, that those services are accessible and of high quality, and that agency policies and actions promote efficiency and quality within the total health care delivery system.

The Bureau of Data Management and Strategy (BDMS) operates HCFA's statistical data systems and maintains the national Medicare statistical files. BDMS also serves as the focal point within the agency for information systems policy, planning, and data standards development.

The Office of Research and Demonstrations (ORD) conducts studies and projects that demonstrate and evaluate optional reimbursement, coverage, eligibility, and management alternatives to the present Federal programs. In addition, ORD examines the impact of HCFA programs on health care status, utilization, and expenditures, as well as their effect on beneficiary access to services, health care providers, and the health care industry.

Health Care Financing Research Reports present the results of major studies and projects conducted by HCFA program staff. These reports contain significant findings which affect HCFA programs and are used as the basis for making program changes.

End Stage Renal Disease, 1986 reflects a wide range of data and analyses regarding the end stage renal disease program. Much of the data in this report emphasize trends and comparisons over time, making this report a standard reference source which illustrates changes in the nature of the Medicare end stage renal disease population and in the pattern of treatment of this population.

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Research Report

End-Stage Renal Disease, 1986

U.S. Department of Health and Human Services
Health Care Financing Administration
Bureau of Data Management and Strategy
Office of Research and Demonstrations
Baltimore, Maryland
December 1988

HCFA Pub. No. 03268

Acknowledgments

This report could not have been compiled without the help of: Zermain Breidenbaugh, Julius Hodges, Helen Mayhew, Michael McMullan, Roger Milam, Patricia Peyton, Kathleen Sagel, and Ida Sarsitis, Bureau of Data Management and Strategy; Paul Eggers, Ph.D., Office of Research and Demonstrations, Health Care Financing Administration; Dr. Neil Otchin, Veterans' Administration, and Dr. Miriam J. Alter, Centers for Disease Control. Editorial review and production management were provided by Doris Hall Simmons, Office of Research and Demonstrations.

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End stage renal disease, 1986

Executive summary

With the enactment of section 299I of Public Law 92-603 (Amendments to the Social Security Act of 1972), Medicare coverage was extended to persons with end stage renal disease (ESRD), effective July 1, 1973. To be eligible for Medicare ESRD benefits, a physician must certify that an individual requires chronic dialysis or a kidney transplant to maintain life. Responsibility for implementing this legislation was shared within the then Department of Health, Education, and Welfare. The then Bureau of Health Insurance within the Social Security Administration was responsible for monitoring Medicare entitlement, utilization, and reimbursement; the Bureau of Quality Assurance within the Public Health Service was responsible for quality assurance standards, including the development of medical information registries of dialysis and transplant patients, which were incorporated into the Public Health Service's medical information system. With the organization of the Health Care Financing Administration (HCFA) in 1976, the tasks of monitoring Medicare program management and ESRD patient information were brought together.

HCFA is charged with the effective administration of Medicare benefits to qualified persons with ESRD. Integral to the effective management of the ESRD program is the operation of a comprehensive data resource covering medical and program information for the Medicare ESRD population. This data resource, known as the ESRD Program Management and Medical Information System (ESRD PMMIS), was required by Public Law 95-292, section (c) (1) (A). This system was designed to serve the needs of the Department of Health and Human Services in support of program analysis, policy development, and epidemiological research.

The ESRD PMMIS incorporates information both on Medicare ESRD patients and on Medicare-approved ESRD hospitals and dialysis facilities. The principal sources of patient-specific information are the Medicare billing records and incidence-specific medical information forms that report onset of ESRD, characteristics and status of transplant, and cause of death. The principal sources of facility information are the Medicare certification approval notices and the annual treatment survey.

The precursor of the current ESRD PMMIS was implemented in 1977. From 1977 through 1980, data forms were collected through the Medicare intermediaries and Medicare central office. These arrangements were less than successful, resulting in a 50-percent rate of noncompliance. In 1981, adjustments were made in the data collection instruments, e.g., tying the reporting of onset of ESRD to the entitlement process, and enlisting the support of the American Society of Transplant Surgeons in the development of the transplant reporting forms. As a result of these changes, reporting compliance has increased substantially; e.g., more than 91 percent of the transplant information forms were received for kidney transplants performed in 1984 and 1985.

The data that are gathered in the ESRD PMMIS and the resulting analyses of the information represent a confederation of interested components within the Department and of professional organizations representing the interest of the renal medical community. Decisions on the design of the forms, the specifications of the computer analyses, the interpretation of the results, and the preparation of publications are made collaboratively among this community.

HCFA recognizes the need to disseminate the information developed from the ESRD PMMIS data and any resulting analyses of these data as promptly as possible. The purpose of this report is to present in a single volume statistics concerning recent trends in ESRD treatment and detailed discussions of selected health issues involving the ESRD population. Several of the tables in this report emphasize trends and comparisons over time, making this report a standard reference source illustrating changes in the nature of the Medicare ESRD population and in the patterns of treatment of this population.

Data that have been released to HCFA from other organizations; i.e., the Veterans' Administration, Centers for Disease Control, European Dialysis and Transplantation Association, Australia and New Zealand Dialysis and Transplant Registry, and Canadian Renal Failure Register have been included whenever appropriate.

NOTES: A glossary of terms associated with ESRD and the Medicare ESRD program is provided in Appendix A. A complete explanation of entitlement provisions is found in Appendix B.

Incidence and enrollment

Program incidence

Trends in Medicare ESRD program incidence for the years 1980-85 are described in this section. The new Medicare ESRD enrollee population by age, sex, race, primary diagnosis, and State, are presented in the accompanying tables.

The total counts of new Medicare ESRD beneficiaries by age, sex, and race, and primary diagnosis are shown in Table 1. In 1980, 18,404 persons were added to the Medicare enrollment files as ESRD beneficiaries. By 1985, the annual number of new ESRD beneficiaries had increased to 28,944, or an average annual increase of 9.5 percent. By age group, the largest rates of growth were among persons 65-74 years of age (12.8 percent), and persons 75 years of age or over (20.8 percent).

The annual rate of increase was greater for females (10.2 percent) than for males (8.9 percent) and was greater for black persons (10.9 percent) than for white persons (9.7 percent). Rates of growth were also high for Asian persons (59.1 percent) and for American Indians (31.6 percent). However, all of these increases are likely because of improved reporting on the HCFA-2728, Chronic Renal Disease Medical Evidence Report.

Annual rates of growth exceeded 20 percent for persons whose renal failure was attributed to diabetes, glomerulonephritis, and hypertension. However, much of this increase was because of better reporting on the HCFA-2728 as shown by a 9.7 percent annual decrease in the other/unknown category.

In 1985, the rate of increase of new enrollees was 10.1 percent. The increase was largest for persons 75 years of age or over (17.2 percent), while there was a decrease 2.3 percent in cases for persons less than 15 years of age.

Of the 28,944 new Medicare ESRD beneficiaries in 1985, 35.5 percent were 65 years of age or over; 54.6 percent were male; 68.4 percent were white; and 27.7 percent had diabetes reported as the primary cause of renal failure.

Medicare ESRD program incidence expressed in terms of rates per million population is shown in Table 2. From 1980-85, program incidence increased

Table 1

Medicare end stage renal disease program incidence, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent change	Percent change 1984-85
				Number of new enrollees				
Total	18,404	19,307	21,815	24,991	26,297	28,944	9.5	10.1
Age								
Under 15 years	374	336	414	382	433	423	2.5	-2.3
15-24 years	1,091	1,115	1,170	1,097	1,151	1,183	1.6	2.8
25-34 years	2,092	2,189	2,458	2,450	2,615	2,684	5.1	2.6
35-44 years	2,244	2,368	2,595	2,832	3,010	3,360	8.4	11.6
45-54 years	3,167	3,234	3,529	3,734	3,841	4,191	5.8	9.1
55-64 years	4,346	4,713	5,263	5,747	6,230	6,818	9.4	9.4
65-74 years	3,746	3,939	4,574	5,982	6,068	6,828	12.8	12.5
75 years and over	1,344	1,413	1,812	2,767	2,949	3,457	20.8	17.2
Sex								
Male	10,316	10,725	12,070	13,754	14,568	15,814	8.9	8.6
Female	8,088	8,582	9,745	11,237	11,729	13,130	10.2	11.9
Race								
Asian	48	126	308	310	378	489	59.1	29.4
Black	4,830	5,000	5,932	7,118	7,391	8,091	10.9	9.5
White	12,474	13,226	15,163	17,009	18,045	19,809	9.7	9.8
American Indian	67	127	194	257	259	264	31.6	1.9
Other/unknown	985	828	218	297	224	291	-21.6	29.9
Diagnosis								
Diabetes	2,225	3,620	4,989	5,867	7,047	8,019	29.2	13.8
Glomerulonephritis	2,208	3,437	5,093	5,486	5,780	6,126	22.6	6.0
Hypertension	2,453	3,918	5,368	5,709	6,354	7,097	23.7	11.7
Polycystic kidney disease	602	832	1,012	1,055	1,057	1,139	13.6	7.8
Other/unknown	10,916	7,500	5,353	6,874	6,059	6,563	-9.7	8.3

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Table 2
Medicare end stage renal disease program incidence rates per million population, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent change	Percent change 1983-84
	Number of enrollees per million population							
Total	81	84	94	107	111	121	8.4	8.9
Age								
Under 15 years	7	7	8	7	8	8	2.2	-2.7
15-24 years	26	26	28	27	29	30	3.1	4.1
25-34 years	56	56	62	61	64	64	2.7	-0.1
35-44 years	87	90	92	96	98	106	4.0	7.7
45-54 years	139	143	157	167	171	186	5.9	8.3
55-64 years	200	215	238	258	279	305	8.9	9.3
65-74 years	239	247	282	362	362	402	10.9	10.8
75 years and over	134	137	170	252	261	300	17.5	14.8
Sex								
Male	93	96	107	121	127	136	7.8	7.2
Female	69	73	82	93	97	107	9.1	10.9
Race								
Asian	13	34	83	83	101	129	57.5	28.0
Black	176	181	212	252	260	281	9.8	8.3
White	64	67	76	85	89	97	8.6	8.6
American Indian	46	86	76	170	170	171	30.3	0.8
Other/unknown	—	—	—	—	—	—	—	—
Diagnosis								
Diabetes	10	16	22	25	30	34	28.2	12.6
Glomerulonephritis	10	15	22	23	24	26	21.4	4.8
Hypertension	11	17	23	24	27	30	22.5	10.5
Polycystic kidney disease	3	4	4	5	4	5	12.5	6.6
Other/unknown	48	33	23	29	26	27	-10.6	7.1

NOTE: Average annual percent change calculated by use of compounding.

SOURCES: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85; and U.S. Department of Commerce, Bureau of the Census: Population Estimates and Projections. *Current Population Reports*. Series P-25, No. 998. Washington. U.S. Government Printing Office.

from 81 enrollees per million persons to 121 enrollees per million persons, an annual increase of 8.4 percent. Incidence rates are strongly related to age, ranging from 8 enrollees per million persons in the under 15 years of age group to 402 enrollees per million persons in the 65-74 years of age group. Males have a higher incidence rate (136 enrollees per million) than do females (107 enrollees per million). Black persons have the highest incidence rate (281 enrollees per million), followed by American Indians (171 enrollees per million), Asian persons (129 enrollees per million), and white persons (97 enrollees per million).

Medicare ESRD program incidence is shown by State in Table 3. Overall, as was shown in Table 2, incidence rates are increasing. This is generally the case for individual States as well. Of the 50 States and the District of Columbia, all States except Alaska had higher program incidence rates in 1985 than in 1980. In 1980, three States had incidence rates greater than 100 enrollees per million persons. In contrast, 31 States had high incidence rates in 1985.

Variations in Medicare ESRD program incidence are illustrated in more depth in Table 4. State incidence rates were averaged across the 6 years 1980-85—to make the estimates more stable. States were ranked from highest to lowest incidence rates. During this interval, the U.S. total incidence rates averaged 98 enrollees per million. The rates ranged from a high of 254 enrollees per million in the District of Columbia to a low of 30 enrollees per million in Alaska. The rates were then age-sex-race adjusted (with the indirect method) to control for demographic differences across States. In general, the age-sex-race adjustment did not greatly alter the ranking of the States. However, it did narrow the range of incidence rates considerably. The District of Columbia, where black persons comprise 70 percent of the total population, had an adjusted incidence rate (119 per million) or 53 percent lower than its unadjusted incidence rate. Similarly, Utah, in which the black population is less than 1 percent of the total, had an adjusted rate (98 per million) or 46 percent greater than the unadjusted rate. Of the 20 States, and the District of Columbia with unadjusted rates higher than the U.S. total rate, 18 States had

Table 3

Medicare end stage renal disease program incidence rates per million population, by State: 1980-85

State	1980	1981	1982	1983	1984	1985
	Number of enrollees per million population					
United States	79	82	92	105	109	119
Alabama	90	88	103	132	124	130
Alaska	30	36	27	35	30	23
Arizona	89	93	98	118	111	123
Arkansas	66	69	74	101	109	111
California	82	87	98	114	113	123
Colorado	64	63	57	58	67	76
Connecticut	75	80	93	120	110	145
Delaware	96	96	117	84	106	141
District of Columbia	215	199	270	270	262	307
Florida	110	111	115	132	138	145
Georgia	93	108	108	131	127	130
Hawaii	89	102	103	107	116	173
Idaho	48	47	60	62	66	83
Illinois	74	84	97	106	112	128
Indiana	63	74	82	96	94	107
Iowa	61	65	70	82	74	93
Kansas	57	61	83	75	85	94
Kentucky	63	69	71	75	86	101
Louisiana	81	94	93	106	122	131
Maine	42	63	55	65	92	82
Maryland	81	90	103	106	123	129
Massachusetts	75	66	85	93	100	95
Michigan	78	77	88	100	114	115
Minnesota	62	67	69	77	86	93
Mississippi	88	75	92	123	122	128
Missouri	71	80	89	90	106	114
Montana	48	77	48	69	85	75
Nebraska	55	75	64	69	73	94
Nevada	89	71	84	112	99	115
New Hampshire	58	70	68	68	74	77
New Jersey	105	101	119	142	127	151
New Mexico	88	70	90	99	97	106
New York	86	86	99	110	116	120
North Carolina	85	81	94	109	113	137
North Dakota	37	62	63	62	74	77
Ohio	70	72	89	97	105	114
Oklahoma	66	72	74	75	87	93
Oregon	52	53	64	83	77	94
Pennsylvania	84	82	96	108	125	136
Rhode Island	81	86	80	106	119	124
South Carolina	92	102	112	125	134	161
South Dakota	46	85	76	79	91	97
Tennessee	75	75	86	108	95	111
Texas	80	86	96	107	104	116
Utah	62	65	51	61	92	68
Vermont	70	54	69	70	72	80
Virginia	99	91	107	130	130	142
Washington	63	64	59	74	79	86
West Virginia	65	66	78	93	110	103
Wisconsin	65	60	81	75	89	88
Wyoming	32	49	55	47	55	65

SOURCES: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85; and U.S. Department of Commerce, Bureau of the Census: Population Estimates and Projections. *Current Population Reports*. Series P-25, No. 998. Washington, U.S. Government Office.

Table 4

Average Medicare end stage renal disease program incidence rates per million population, by State: 1980-85

State	Unadjusted		Age, sex, race, adjusted	
	Rate	Rank	Rate	Rank
	Number of enrollees per million population			
Alabama	111	8	94	22
Alaska	30	51	36	51
Arkansas	88	28	81	44
Arizona	106	10	108	6
California	103	17	92	26
Colorado	64	47	76	47
Connecticut	104	15	110	3
Delaware	107	9	105	9
District of Columbia	254	1	119	1
Florida	126	2	108	7
Georgia	116	6	104	11
Hawaii	116	7	61	50
Idaho	61	49	79	45
Illinois	100	19	97	18
Indiana	86	29	97	17
Iowa	74	38	88	34
Kansas	76	37	83	38
Kentucky	78	34	88	35
Louisiana	105	13	90	29
Maine	66	46	81	42
Maryland	105	11	95	21
Massachusetts	86	30	96	20
Michigan	95	23	99	13
Minnesota	76	36	94	23
Mississippi	105	14	82	40
Missouri	92	26	92	25
Montana	67	44	81	43
Nebraska	72	39	83	37
Nevada	96	22	106	8
New Hampshire	69	43	88	36
New Jersey	124	3	118	2
New Mexico	92	24	91	28
New York	103	18	92	27
North Carolina	104	16	92	24
North Dakota	63	48	76	48
Ohio	91	27	96	19
Oklahoma	78	33	78	46
Oregon	71	41	83	39
Pennsylvania	105	12	104	10
Rhode Island	99	20	109	4
South Carolina	122	4	104	12
South Dakota	79	32	90	31
Tennessee	92	25	89	33
Texas	99	21	98	16
Utah	67	45	98	15
Vermont	69	42	90	32
Virginia	117	5	109	5
Washington	71	40	81	41
West Virginia	86	31	98	14
Wisconsin	76	35	90	30
Wyoming	51	50	69	49

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

lower adjusted rates. Of the 30 States with unadjusted rates below the U.S. total rate, 25 States had higher adjusted rates. On an unadjusted basis, 20 States and the District of Columbia had incidence rates of 20 enrollees per million persons higher or lower than the U.S. total rate. After adjustment for age, sex, and (primarily) race, only 6 States were more than 20 per million different than the U.S. total.

Incidence rates for the years 1980-85 for a number of countries that have end stage renal disease registries, and for the United States are presented in Table 5. In 1985, most of these countries had incidence rates between 30 and 60 per million population. These rates probably represent not only a difference in underlying renal failure, but medical and economic constraints among the various countries as well. During the period 1980-85, there was an increase in incidence in virtually all of the countries shown in Table 5. Thus, it would appear that the trend toward expansion of renal treatment in the United States is paralleled to other Western countries. Nevertheless, in 1985, treated renal failure among white persons in the United States was more than 50 percent higher than in any of the displayed countries.

Table 5

New end stage renal disease patients per million population for selected countries: 1980-85

Country	1980	1981	1982	1983	1984	1985	Average annual percent increase	Percent change 1984-85
			Number of patients per million					
Austria	34	41	41	54	62	57	10.9	-8.1
Belgium	42	48	48	61	70	62	8.1	-11.4
Bulgaria	7	14	23	28	20	33	36.4	65.0
Czechoslovakia	15	17	20	21	21	23	8.9	9.5
Denmark	29	37	32	40	40	43	8.2	7.5
Federal Republic of Germany	47	51	52	56	67	59	4.7	-11.9
Finland	38	37	34	46	35	45	3.4	28.6
France	42	44	41	44	49	43	0.5	-12.2
German Democratic Republic	20	22	26	28	33	32	9.9	-3.0
Greece	21	32	29	41	47	58	22.5	23.4
Hungary	5	6	12	12	14	19	30.6	35.7
Iceland	10	25	35	5	50	0	—	-100.0
Ireland	22	25	21	24	28	48	16.9	71.4
Israel	58	52	62	67	75	59	0.3	-21.3
Italy	38	43	43	46	48	47	4.3	-2.1
Luxembourg	48	33	45	73	38	52	1.6	36.8
Netherlands	32	35	32	46	34	49	8.9	44.1
Norway	38	49	39	54	53	36	1.1	-32.1
Poland	6	6	7	8	11	10	10.8	-9.1
Portugal	12	18	28	41	43	49	32.5	14.0
Spain	38	40	42	61	59	45	3.4	-23.7
Sweden	47	47	53	61	60	62	5.7	3.3
Switzerland	48	45	49	55	47	59	4.2	25.5
United Kingdom	25	28	31	33	34	43	11.5	26.5
Yugoslavia	18	23	21	32	36	32	12.2	-11.1
Australia	38	38	37	38	45	39	0.5	-13.3
New Zealand	30	35	33	30	34	37	4.3	8.8
Canada	—	49	51	53	58	61	—	5.2
United States[1]	81	84	94	107	111	121	8.4	8.9
White	64	67	76	85	89	97	8.6	8.6
Black	176	181	212	252	260	281	9.8	8.3
Asian	13	34	83	83	101	129	57.5	28.0
Indian	46	86	76	170	170	171	30.3	0.8

[1] Includes only Medicare entitled end stage renal disease (ESRD) patients. Of all ESRD patients in the United States, it is estimated that 7 to 10 percent are not Medicare eligible.

SOURCES: Health Care Financing Administration, Bureau of Data Management and Stragegy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85; European Dialysis and Transplant Association (EDTA) Combined Report on Regular Dialysis and Transplantation in Europe, 1980-85; Canadian Renal Failure Register, 1985; Tenth Report of the Australia and New Zealand Dialysis and Transplant Registry, July 1987.

Table 6

Medicare end stage renal disease enrollment, by dialysis and functioning graft: 1980-85

Year	All patients		Patients on dialysis		Patients with a functioning graft	
	Number	Percent	Number	Percent	Number	Percent
1980	64,093	100.0	56,321	87.9	7,772	12.1
1981	71,626	100.0	62,652	87.5	8,974	12.5
1982	80,442	100.0	69,580	86.5	10,862	13.5
1983	90,365	100.0	77,167	85.4	13,198	14.6
1984	99,307	100.0	83,086	83.7	16,221	16.3
1985	108,120	100.0	88,510	81.9	19,610	18.1
Average annual percent increase	11.0	—	9.5	—	20.3	—
1984-85 percent increase	8.9	—	6.5	—	20.9	—

NOTES: Enrollment is as of December 31 of each year and includes Medicare patients who are alive and currently entitled. Average annual percent increase calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Table 7

Medicare end stage renal disease program enrollment for dialysis patients, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent change	Percent change 1984-85
	Number of patients							
Total	56,321	62,652	69,580	77,167	83,086	88,510	9.5	-6.5
Age								
Under 15 years	676	706	792	814	803	756	2.3	-5.9
15-24 years	3,107	3,270	3,362	3,268	3,188	3,113	0.0	-2.4
25-34 years	6,563	7,175	7,735	7,998	8,206	8,373	5.0	2.0
35-44 years	7,820	8,587	9,376	10,368	11,015	11,670	8.3	5.9
45-54 years	10,817	11,749	12,623	13,336	14,100	14,686	6.3	4.2
55-64 years	14,116	15,879	17,727	19,416	20,888	22,141	9.4	6.0
65-74 years	10,224	11,639	13,465	15,975	17,794	19,495	13.8	9.6
75 years and over	2,998	3,647	4,500	5,992	7,092	8,276	22.5	16.7
Sex								
Male	30,983	34,198	37,731	41,597	44,636	47,102	8.7	5.5
Female	25,338	28,454	31,849	35,570	38,450	41,408	10.3	7.7
Race								
Asian	140	258	480	655	825	1,052	49.7	27.5
Black	16,452	18,530	21,096	24,075	26,567	28,890	11.9	8.7
White	36,688	40,643	44,948	49,291	52,585	55,438	8.6	5.4
American Indian	149	183	326	505	631	712	36.7	12.8
Other/unknown	2,892	3,038	2,730	2,641	2,478	2,418	-3.5	-2.4
Diagnosis								
Diabetes	4,299	6,164	8,562	10,853	13,486	15,811	29.8	17.2
Glomerulonephritis	8,549	10,419	13,137	15,529	17,466	19,173	17.5	9.8
Hypertension	6,972	9,187	12,062	14,584	16,864	18,977	22.2	12.5
Polycystic kidney disease	2,631	3,099	3,636	4,060	4,352	4,619	11.9	6.1
Other/unknown	33,870	33,783	32,183	32,141	30,918	29,930	-2.4	-3.2

NOTES: All calculations are based on unrounded numbers. Average annual percent change calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Program enrollment

Trends in Medicare ESRD program enrollment for the years 1980-85 are described in this section. Tables are presented that show Medicare ESRD enrollment by age, sex, race, and primary diagnosis. Enrollment is broken into two distinct groups of persons: those on dialysis and those with a functioning graft. Enrollment counts are taken as of December 31 of each year and reflect the patients' dialysis or transplant status as of that date.[1]

Medicare enrollment by dialysis and functioning graft patient groups for the years 1980-85 is presented in Table 6. During this time, enrollment grew from 64,093 to 108,120—an average annual rate of increase of 11.0 percent. The number of persons on dialysis grew at a slower rate of 9.5 percent per year (from 56,321 in 1980 to 88,510 in 1985). From 1984 to 1985, the rate of growth was only 6.5 percent. The number of patients with a functioning kidney graft increased at an annual rate of more than 20 percent (from 7,772 in 1980 to 19,610 in 1985). The reasons for the rapid growth in patients with a functioning graft are increases in the number of transplants performed and increased graft survival rates. As a result of these transplantation trends, patients with a functioning graft increased from 12.1 percent of the total Medicare ESRD population in 1980 to 18.1 percent in 1985.

Medicare dialysis patient population by age, sex, race, and primary diagnosis for the years 1980-85 is shown in Table 7. Growth in the dialysis patient population has been greatest for persons 65 years of age or over, primarily as a result of the increased program incidence rates shown in Table 1 and 2. In 1980, persons 65 years of age or over accounted for 23.5 percent of the total dialysis patient population, increasing to 31.4 percent in 1985. The impact of transplantation is evident in dialysis patient trends for the younger age groups. For the under age 15 group, dialysis population growth peaked in 1983 and declined in both 1984 and 1985. For persons 15-24 years of age, the dialysis population peaked in 1982 and has been followed by 3 consecutive years of decreases.

In 1985, 53.2 percent of the Medicare dialysis population were male; 62.6 percent were white persons, and 17.9 percent were persons for whom diabetes was reported as the primary cause of renal failure.

Medicare dialysis patient population expressed as enrollment per million population is shown in Table 8. Overall, dialysis patient enrollment increased from 248 per million population in 1980 to 371 per million in 1985 — annual increase of 8.4 percent. Dialysis enrollment rates vary markedly with age, ranging from 15 per million for persons 15 years of age or less to 1,147 per million for persons 65-74 years of age. Males have an enrollment rate 19.8 percent greater than females (405 per million and 338 per million, respectively). Dialysis patient enrollment for black persons is 3.7 times as great as for white persons (1,004 per million, and 271 per million, respectively). Enrollment rates among Asian persons and American Indians are probably underestimated because of underreporting in earlier years.

The Medicare ESRD population with a functioning graft is presented in Table 9 by age, sex, race, and primary diagnosis for the years 1980-85. Table 10 shows the same population in terms of rates per million population. In contrast to the dialysis population, those persons with a functioning graft come largely from the younger age groups. In 1980 and 1985, 90.8 percent and 88.2 percent, respectively, of persons with a functioning graft were under 55 years of age.

In 1985, 63.0 percent of the Medicare ESRD population with a functioning kidney graft were male; 78.1 percent were white persons; and 14.8 percent were persons for whom diabetes was reported as the primary cause of renal failure.

In terms of rates per million population, the ESRD functioning graft population has increased from 34 per million in 1980 to 82 per million in 1985, a 19.2 percent annual increase. In 1985, those persons 34-44 years of age, and 45-54 years of age had the highest rate per million population (171 per million and 167 per million, respectively). The rate was higher for males (106 per million) than for females (59 per million) and was higher for black persons (125 per million) than for white persons (75 per million).

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[1] Before 1984, there were problems of underreporting of kidney transplants. Consequently, some people who have a functioning graft will be misclassified as on dialysis. Therefore, the data will tend to overestimate the number of persons on dialysis and underestimate the number of people with functioning grafts.

Table 8

Medicare end stage renal disease program dialysis enrollment per million population, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent change	Percent change 1984-85
			Number of enrollees per million					
Total	248	273	300	330	352	371	8.4	5.4
Age								
Under 15 years	13	14	15	16	16	15	2.0	-6.2
15-24 years	73	78	81	80	80	79	1.5	-1.1
25-34 years	175	184	196	199	201	199	2.6	-0.7
35-44 years	303	325	333	353	359	367	3.9	2.2
45-54 years	476	520	563	596	629	650	6.5	3.4
55-64 years	649	723	802	873	936	991	8.9	5.9
65-74 years	653	731	831	968	1,063	1,147	11.9	7.9
75 years and over	298	353	422	546	628	718	19.2	14.3
Sex								
Male	281	307	335	366	389	405	7.6	4.3
Female	217	241	267	296	317	338	9.3	6.7
Race								
Asian	39	71	130	176	219	277	48.2	26.1
Black	601	670	755	853	933	1,004	10.8	7.6
White	188	207	226	246	260	271	7.5	4.3
American Indian	101	123	218	334	414	462	35.4	11.6
Other/unknown	—	—	—	—	—	—	—	—
Diagnosis								
Diabetes	19	27	37	46	57	66	28.5	16.0
Glomerulonephritis	38	45	57	66	74	80	16.4	8.6
Hypertension	31	40	52	62	71	79	21.0	11.3
Polycystic kidney disease	12	14	16	17	18	19	10.8	5.0
Other/unknown	149	147	139	137	131	125	-3.4	-4.2

NOTES: All calculations are based on unrounded numbers. Average annual percent change calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Table 9

Medicare end stage renal disease program enrollment for patients with functioning grafts, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent change	Percent change 1984-85
				Number of patients				
Total	7,772	8,974	10,862	13,198	16,221	19,610	20.3	20.9
Age								
Under 15 years	260	284	349	434	550	664	20.6	9.3
15-24 years	1,208	1,304	1,490	1,725	1,930	2,162	12.7	9.4
25-34 years	2,301	2,694	3,174	3,816	4,593	5,276	17.8	16.1
35-44 years	1,830	2,205	2,790	3,432	4,348	5,424	24.5	21.6
45-54 years	1,455	1,654	2,000	2,444	3,010	3,764	23.0	23.5
55-64 years	646	748	946	1,197	1,588	2,022	28.8	31.3
65-74 years	70	82	110	147	197	290	39.7	50.3
75 years and over	2	3	3	3	5	8	38.0	87.5
Sex								
Male	4,724	5,528	6,777	8,261	10,185	12,358	21.2	21.3
Female	3,048	3,446	4,085	4,937	6,036	7,252	18.9	20.1
Race								
Asian	17	21	60	126	201	259	72.4	28.9
Black	1,187	1,381	1,767	2,257	2,870	3,585	24.7	24.9
White	6,169	7,043	8,523	10,333	12,725	15,325	20.0	20.4
American Indian	29	107	120	139	140	170	42.4	21.4
Other/unknown	370	422	392	343	285	271	-6.0	-4.9
Diagnosis								
Diabetes	533	721	1,086	1,531	2,112	2,910	40.4	37.8
Glomerulonephritis	1,923	2,245	2,896	3,765	4,934	6,100	26.0	23.6
Hypertension	468	575	833	1,154	1,529	1,983	33.5	29.7
Polycystic kidney disease	259	306	439	606	847	1,059	32.5	25.0
Other/unknown	4,589	5,127	5,608	6,142	6,799	7,558	10.5	11.2

NOTES: All calculations are based on unrounded numbers. Average annual percent change caluclated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Table 10

Medicare end stage renal disease program enrollment per million population for patients with functioning grafts, by age, sex, race, and primary diagnosis: 1980-85

Age, sex, race, and primary diagnosis	1980	1981	1982	1983	1984	1985	Average annual percent increase	Percent increase 1984-85
				Number of patients per million				
Total	34	39	47	56	69	82	19.2	19.6
Age								
Under 15 years	5	6	7	8	11	13	20.3	8.9
15-24 years	28	31	36	42	48	55	14.3	10.9
25-34 years	61	69	81	95	112	126	15.2	13.0
35-44 years	71	83	99	117	142	171	19.4	17.4
45-54 years	64	73	89	109	134	167	23.1	22.6
55-64 years	30	34	43	54	71	91	28.2	31.1
65-74 years	4	5	7	9	12	17	37.4	48.1
75 years and over	0	0	0	0	0	1	34.2	83.6
Sex								
Male	43	50	60	73	89	106	20.0	19.9
Female	26	29	34	41	50	59	17.8	19.0
Race								
Asian	5	6	16	34	53	68	70.7	27.5
Black	43	50	63	80	101	125	23.5	23.6
White	32	36	43	52	63	75	18.8	19.1
American Indian	20	72	80	92	92	110	41.0	20.1
Other/unknown	—	—	—	—	—	—	—	—
Diagnosis								
Diabetes	2	3	5	7	9	12	39.0	36.3
Glomerulonephritis	8	10	12	16	21	26	24.7	22.3
Hypertension	2	3	4	5	6	8	32.2	28.3
Polycystic kidney disease	1	1	2	3	4	4	31.2	23.7
Other/unknown	20	22	24	26	29	32	9.4	10.0

NOTES: All calculations are based on unrounded numbers. Average annual percent increase calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, August 1987 update, 1980-85.

Patient treatment trends

Dialysis patients

The statistics in this section are taken from the End Stage Renal Disease Facility Survey, Form HCFA-2744. The facility survey covers all patients receiving services at Medicare-approved dialysis facilities and transplant centers. All figures shown are as of December 31 of the year given. It includes both Medicare and non-Medicare entitled patients and thus, is not strictly comparable to the Medicare ESRD population described in the previous section.

The ESRD dialysis population by type and place of dialysis for the years 1981-86 are shown in Table 11. During these years the total U.S. dialysis population increased from 58,924 to 90,886, or an average annual growth rate of 9.1 percent. However, the rate of growth declined in each of the years to the point where growth in 1986 was only 7.2 percent. By far the most common dialysis modality is in-unit hemodialysis. Patients receiving dialysis in this modality increased from 48,011 in 1981 to 72,756 in 1986. In 1986, in-unit hemodialysis accounted for 80.3 percent, slightly less than the 81.5 percent of this modality in 1981. A small number of patients receive in-unit peritoneal dialysis. However, the number of these patients has declined and by 1986 accounted for only 0.6 percent of all dialysis patients.

The remaining dialysis patients either dialyze at home or are involved in a self-dialysis training program. The two fastest growing forms of dialysis are continuous ambulatory peritoneal dialysis (CAPD) and continuous cycling peritoneal dialysis (CCPD). CAPD grew at about 2,000 patients per year through 1983 and about 1,500 patients in 1984 and 1985. The increase from 1985 to 1986 was only about 677 patients, an increase of only 6.0 percent. CCPD was broken out as a separate category in the 1984 facility survey. The number of patients on CCPD increased by 14.4 percent in 1985 and by 37.0 percent in 1986. In 1986, CAPD and CCPD patients accounted for 13.4 and 1.4 percent of all patients on dialysis, respectively.

Since 1981, the home hemodialysis population has declined in every year, from 4,481 in 1981 to 3,675 in 1986. In 1986, home hemodialysis patients comprised 4.0 percent of the total dialysis population and 21.5 percent of the total home dialysis population.

The number of patients participating in some form of self-care dialysis is shown in Table 12. The number of patients in self-care dialysis has increased from 10,512 in 1981 to 18,682 in 1986, an annual increase of 12.2 percent. However, in 1986, the increase was only 3.0 percent. In 1986, CAPD and CCPD patients accounted for 63.8 percent and 7.0 percent of all self-care dialysis patients, respectively.

The number of persons completing self-dialysis training is shown in Table 12. Although the number of persons completing self-dialysis training increased by 9.8 percent per year during the entire time span, the increase from 1985 to 1986 was only 0.7 percent. In 1986, the number of persons completing CAPD training increased by only 2.1 percent, whereas the increase for CCPD was 28.7 percent.

Transplant patients

The trend in numbers of kidney transplant patients since the ESRD program's inception is shown in Table 13. The numbers increased from 1974-86 by an average annual rate of 9.0 percent. In two of these years, 1976 and 1978, the number of transplant patients declined. However, since 1978, the numbers increased from 3,949 to 8,948, an annual rate of increase of 10.8 percent. The 16.6 percent increase in 1986 was the second largest percentage increase since 1974.

Most kidney transplant patients are covered by Medicare. In 1981, there were 4,421 Medicare covered transplant patients. This increased in the following 5 years to 8,258. In 1986, Medicare covered 92.0 percent of all kidney transplants, up slightly from 90.5 percent in 1980.

Kidney transplants by donor type for the years 1980-86 are shown in Table 14. In 1980, cadaveric transplants accounted for 3,422, or 72.9 percent of the 4,697 total kidney transplants in the U.S. The number of cadaveric transplants increased by an annual rate of 12.9 percent, as compared to the 6.8 percent annual increase among living-related donor transplants. Consequently, by 1986, nearly four-fifths (79.0 percent) of all transplants were from cadaver donors.

From 1980-86, the number of persons awaiting transplant increased from 5,072 to 11,108—an average annual increase of 14.0 percent (Table 15). In 1980, 9.7 percent of all dialysis patients were awaiting a transplant. By 1986, this had increased to 12.2 percent, perhaps indicating a broader range of dialysis patients are being added to the waiting lists.

Table 11

End stage renal disease dialysis population, by type and place of dialysis: 1981-86[1]

Type and place of dialysis	1981	1982	1983	1984	1985	1986	Average annual percent change	Percent change 1985-86
				Number of patients				
Total	58,924	65,765	71,987	78,483	84,797	90,886	9.1	7.2
In-unit hemodialysis	48,011	52,559	57,029	62,174	67,241	72,756	8.7	7.6
In-unit peritoneal	944	885	745	590	584	510	-11.6	-12.7
Home hemodialysis	4,481	4,394	4,323	4,125	3,983	3,675	-3.9	-7.7
Home peritoneal[2]	646	816	790	259	231	191	-21.6	-17.3
CAPD[3]	4,347	6,523	8,532	9,995	11,236	11,913	22.3	6.0
CCPD[4]	—	—	—	859	953	1,307	23.4	37.0
Self training	495	588	568	481	569	534	1.5	-6.2

[1] Counts are as of December 31 of each year from the End Stage Renal Disease (ESRD) Facility Surveys.

[2] This figure decreased significantly in 1984, partially because the CCPD patients were counted in this category in previous years. A CCPD category was added to the ESRD Facility Survey in 1984.

[3] Continuous ambulatory peritoneal dialysis.

[4] Continuous cycling peritoneal dialysis.

NOTE: Average annual percent change calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1981-86.

Table 12

Self-care dialysis population, by type and place of dialysis: 1981-86

Type and place of dialysis	1981	1982	1983	1984	1985	1986	Average annual percent change	Percent change 1985-86
				Number of patients				
Total self-care population[1]	10,512	12,804	15,123	16,855	18,130	18,682	12.2	3.0
Completed training	5,797	6,748	7,345	8,112	9,190	9,258	9.8	0.7
In-unit self-care hemodialysis population	1,031	1,060	1,475	1,611	1,726	1,595	9.1	-7.6
Completed training	528	465	560	525	640	543	0.6	-15.2
Home hemodialysis population	4,481	4,394	4,323	4,125	3,983	3,675	-3.9	-7.7
Completed training	1,150	1,100	1,140	1,086	1,047	874	-5.3	-16.5
Home peritoneal population[2]	646	816	790	259	231	191	-21.6	-17.3
Completed training	534	669	581	247	165	141	-23.4	-14.5
CAPD[3] population	4,347	6,523	8,532	9,995	11,236	11,913	22.3	6.0
Completed training	3,574	4,505	5,061	5,691	6,584	6,723	13.5	2.1
CCPD[4] population	—	—	—	859	953	1,307	23.4	37.1
Completed training	—	—	—	562	752	968	31.2	28.7

[1] Total self-care training includes a small number of in-unit peritoneal patients.

[2] This figure decreased significantly in 1984, partially because of CCPD patients were counted in this category in previous years. A CCPD category was added to the End Stage Renal Disease Facility Survey in 1984.

[3] Continuous ambulatory peritoneal dialysis.

[4] Continuous cycling peritoneal dialysis.

NOTE: Average annual percent change calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1981-86.

Table 13

Kidney transplant patients, by Medicare coverage: 1973-86

			Medicare coverage[1]			
	Total		Medicare		Non-Medicare	
Year	Number	Percent change	Number	Percent change	Number	Percent Change
1973[2]	1,600	—	—	—	—	—
1974	3,190	—	—	—	—	—
1975	3,730	+16.9	—	—	—	—
1976	3,504	-6.1	—	—	—	—
1977	3,973	+13.4	—	—	—	—
1978	3,949	-0.6	—	—	—	—
1979	4.271	+8.2	—	—	—	—
1980	4,697	+10.0	—	—	—	—
1981	4,885	+4.0	4,421	—	464	—
1982	5,358	+9.7	4,917	+11.2	441	-5.0
1983	6,112	+14.1	5,616	+14.2	496	+12.5
1984	6,968	+14.0	6,029	+7.4	939	+89.3
1985	7,676	+10.2	7,073	+17.3	603	-35.8
1986	8,948	+16.6	8,258	+16.8	690	+8.3
			Average annual percent change			
1973-86	—	+9.0	—	+13.3	—	+8.3

[1] Separate count of transplant patients by Medicare entitlement was not captured until the 1981 End Stage Renal Disease Facility Survey.

[2] 1973 data cover the period July 1 through December 31; Medicare end stage renal disease coverage became effective on July 1, 1973. The overall rate of growth is therefore calculated from 1974. For Medicare and non-Medicare transplants, the rate of growth is calculated from 1981.

NOTE: Average annual percent change calculated by use of compounding.

SOURCES: National Institute of Allergy and Infectious Diseases, National Institute of Health: Medicare Health Insurance System counts, 1973-75. Social Security Administration, Bureau of Health Insurance: Data from the Facility Survey Tables, 1976-77. Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1978-86.

Table 14

Kidney transplants, by donor type: 1980-86

			Donor type			
	Total		Cadaver		Living related	
Year	Number	Percent change	Number	Percent change	Number	Percent change
1980	4,697	—	3,422	—	1,275	—
1981	4,885	+4.0	3,427	+0.1	1,458	+14.4
1982	5,358	+9.7	3,681	+7.4	1,677	+15.0
1983	6,112	+14.1	4,328	+17.6	1,784	+7.0
1984	6,968	+14.0	5,264	+21.6	1,704	-5.1
1985	7,695	+10.4	5,819	+10.5	1,876	+10.1
1986	8,976	+16.6	7,089	+21.8	1,887	+0.6
			Average annual percent change			
1980-86	—	+11.4	—	+12.9	—	+6.8

NOTE: Average annual percent increase calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1980-86.

Table 15
Patients awaiting transplants: 1980-86

Year	Number of patients	Percent increase	Percent of dialysis population
1980	5,072	—	9.7
1981	5,773	13.8	9.8
1982	6,720	16.4	10.2
1983	7,176	6.2	10.0
1984	8,562	19.9	10.9
1985	9,791	14.4	11.5
1986	11,108	13.5	12.2
	Average annual percent increase		
1980-86	—	14.0	—

NOTE: Average annual percent increase calculated by use of compounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1980-86.

End stage renal disease facility survey data

Information presented in Tables 16 through 24 was collected through the use of Form HCFA-2744, ESRD Facility Survey. All surveyed Medicare-approved providers of renal services are required to complete this form annually, covering the period January 1 through December 31.

The rate of compliance in completing the ESRD Facility Survey was 100 percent. It is important to note, however, that the number of facilities surveyed does not equal the number of Medicare-approved facilities in the country. Some ESRD hospitals were excluded from consideration because they provide only backup dialysis on an acute basis, rather than routine maintenance dialysis. Other facilities were not requested to complete an ESRD Facility Survey because they were so recently certified that there was insufficient time to include them in the survey population. In addition, there are a number of facilities providing dialysis services which are not Medicare certified, such as several Veterans' Administration and Department of Defense facilities. These facilities are not included in the survey totals. Consequently, enrollment counts from the facility surveys are not directly comparable to enrollment counts from the Medicare enrollment files reported in Tables 6 through 10.

These tables are arrayed either nationally or by state. Aggregate dialysis patient population figures (end-of-survey period) are as of December 31. Other tables reflect activity for the entire survey period, unless otherwise noted. Some tables display patients by Medicare status: Currently enrolled in Medicare, Medicare application pending, and non-Medicare. Patients appearing in the non-Medicare category may include those who are covered by the Veterans' Administration, those who are covered by private insurance (including those who have employer group health insurance coverage for the first year of ESRD, with Medicare becoming the primary insurer after the first year), those who are covered by Medicaid, and foreign nationals.

The data reported via the ESRD Facility Survey delineate totals for all patients with ESRD; that is, the data are not differentiated within the various treatment modalities between patients who have attained entitlement to Medicare benefits and those who have not.

Although we have no data to definitely indicate what portion of the patients in any particular treatment modality were recipients of Medicare benefits, we know through the ESRD Facility Survey that at the end of 1986, 87.74 percent of all patients were entitled to Medicare benefits; 5.59 percent had applications for Medicare entitlement pending; and 6.68 percent were not eligible for Medicare.

We estimate that approximately 200 home hemodialysis patients are not counted in the facility survey counts. This is due to reporting problems with new health care delivery entities.

Table 16

End stage renal disease facilities surveyed and reporting, by State: 1986

State	Dialysis facility		Transplant center	
	Surveyed	Reporting	Surveyed	Reporting
Total	1,526	1,526	185	185
Alabama	31	31	2	2
Alaska	2	2	0	0
Arizona	27	27	4	4
Arkansas	20	20	2	2
California	186	186	16	16
Colorado	13	13	3	3
Connecticut	17	17	2	2
Delaware	4	4	0	0
District of Columbia	17	17	5	5
Florida	94	94	4	4
Georgia	53	53	5	5
Hawaii	9	9	1	1
Idaho	6	6	0	0
Illinois	65	65	8	8
Indiana	20	20	2	2
Iowa	13	13	3	3
Kansas	11	11	2	2
Kentucky	17	17	2	2
Louisiana	53	53	6	6
Maine	5	5	1	1
Maryland	30	30	3	3
Massachusetts	27	27	8	8
Michigan	38	38	9	9
Minnesota	16	16	3	3
Mississippi	22	22	1	1
Missouri	37	37	8	8
Montana	4	4	0	0
Nebraska	9	9	2	2
Nevada	4	4	0	0
New Hampshire	4	4	0	0
New Jersey	27	27	3	3
New Mexico	13	13	2	2
New York	106	106	13	13
North Carolina	33	33	5	5
North Dakota	4	4	0	0
Ohio	43	43	11	11
Oklahoma	25	25	4	4
Oregon	9	9	1	1
Pennsylvania	84	84	9	9
Puerto Rico	14	14	1	1
Rhode Island	6	6	0	0
South Carolina	27	27	1	1
South Dakota	7	7	0	0
Tennessee	47	47	4	4
Texas	106	106	13	13
Utah	13	13	3	3
Vermont	1	1	1	1
Virgin Islands	2	2	1	1
Virginia	47	47	4	4
Washington	16	16	5	5
West Virginia	13	13	0	0
Wisconsin	25	25	2	2
Wyoming	1	1	0	0
American Samoa	1	1	0	0
Guam	1	1	0	0
Mariana Islands	1	1	0	0

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 17
Dialysis patient eligibility status, by State: 1986

State	Facilities reporting	Total dialysis patients	Eligibility status: Currently enrolled in Medicare	Eligibility status: Medicare application pending	Eligibility status: Non-Medicare
Total	1,526	90,886	79,739	5,076	6,071
Alabama	31	1,866	1,726	57	83
Alaska	2	51	41	7	3
Arizona	27	1,201	889	165	147
Arkansas	20	785	654	33	98
California	186	10,218	8,759	589	870
Colorado	13	803	718	39	46
Connecticut	17	1,158	1,036	79	43
Delaware	4	270	233	21	16
District of Columbia	17	904	695	69	140
Florida	94	4,913	4,401	224	288
Georgia	53	2,840	2,556	105	179
Hawaii	9	528	460	35	33
Idaho	6	153	143	3	7
Illinois	65	4,136	3,459	298	379
Indiana	20	1,749	1,622	85	42
Iowa	13	737	712	18	7
Kansas	11	580	545	27	8
Kentucky	17	988	786	100	102
Louisiana	53	2,077	1,788	103	186
Maine	5	243	219	17	7
Maryland	30	1,816	1,590	104	122
Massachusetts	27	2,050	1,749	122	179
Michigan	38	3,000	2,613	156	231
Minnesota	16	1,066	932	101	33
Mississippi	22	1,283	1,168	49	66
Missouri	37	1,842	1,628	146	68
Montana	4	219	193	17	9
Nebraska	9	433	417	4	12
Nevada	4	353	305	30	18
New Hampshire	4	196	181	7	8
New Jersey	27	3,486	3,084	193	209
New Mexico	13	516	423	41	52
New York	106	8,345	7,102	539	704
North Carolina	33	2,591	2,308	99	184
North Dakota	4	156	134	11	11
Ohio	43	3,337	2,925	225	187
Oklahoma	25	724	647	52	25
Oregon	9	683	628	39	16
Pennsylvania	84	4,893	4,336	324	233
Puerto Rico	14	1,219	1,110	32	77
Rhode Island	6	435	398	29	8
South Carolina	27	1,703	1,576	46	81
South Dakota	7	132	125	4	3
Tennessee	47	2,016	1,858	77	81
Texas	106	6,147	5,526	259	362
Utah	13	355	320	24	11
Vermont	1	81	76	4	1
Virgin Islands	2	23	13	2	8
Virginia	47	2,538	2,232	77	229
Washington	16	1,339	1,194	92	53
West Virginia	13	547	471	35	41
Wisconsin	25	1,067	976	57	34
Wyoming	1	22	20	2	0
American Samoa	1	13	12	0	1
Guam	1	42	27	3	12
Mariana Islands	1	18	0	0	18

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 18
Dialysis patient counts, place of dialysis: United States, 1986

	Place of dialysis					
Patient count	Total	Percent	In-unit	Percent	Home	Percent
Dialysis patients beginning survey	84,883	—	68,472	80.67	16,411	19.33
Additions	53,970	—	46,253	85.70	7,717	14.30
New starts	33,452	61.98	28,063	60.67	5,389	69.83
Restarted	601	1.11	514	1.11	87	1.13
Transferred in	17,773	32.93	15,872	34.32	1,901	24.63
Returned after transplant	2,144	3.97	1,804	3.90	340	4.41
Losses	47,967	—	40,549	84.54	7,418	15.46
Deaths	19,987	41.67	16,835	41.52	3,152	42.49
Recovered function	1,193	2.49	1,039	2.56	154	2.08
Transplanted	7,895	16.46	6,046	14.91	1,849	24.93
Transferred out	17,577	36.64	15,512	38.25	2,065	27.84
Discontinued dialysis	1,088	2.2	940	2.32	148	2.00
Lost to followup	227	0.47	177	0.44	50	0.67
Number needed to balance[1]	0	—	-376	—	376	—
Dialysis patients end of survey	90,886	—	73,800	81.20	17,086	18.80
Hemodialysis	76,699	84.39	73,024	98.95	3,675	21.51
Peritoneal dialysis	709	0.78	518	0.70	191	1.12
CAPD[2]	12,141	13.36	228	0.31	11,913	69.72
CCPD[3]	1,337	1.47	30	0.04	1,307	7.65
Medicare status	90,886	—	—	—	—	—
Medicare	79,739	87.74	—	—	—	—
Medicare pending	5,076	5.59	—	—	—	—
Non-Medicare	6,071	6.68	—	—	—	—

[1] Accurate counts are not always available because of the movement of home patients, self-care training, and in-unit backup dialysis.

[2] Continuous ambulatory peritoneal dialysis.

[3] Continuous cycling peritoneal dialysis.

NOTE: Percents may not add to total because of rounding.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 19
Patients receiving care in-unit, by State: December 31, 1986

			Staff assisted dialysis		In-unit self-dialysis		Self-dialysis training			
State	Facilities reporting	Total in-unit patients	Hemo[1]	Peri[1]	Hemo[1]	Peri[1]	Hemo[1]	Peri[1]	CAPD[2]	CCPD[3]
Total	1,526	73,800	71,161	509	1,595	1	268	8	228	30
Alabama	31	1,478	1,467	0	6	0	1	0	4	0
Alaska	2	47	47	0	0	0	0	0	0	0
Arizona	27	900	843	0	57	0	0	0	0	0
Arkansas	20	570	552	11	3	0	3	0	1	0
California	186	9,144	8,889	3	219	0	18	0	15	0
Colorado	13	558	554	0	0	0	1	0	3	0
Connecticut	17	919	881	14	19	0	0	0	5	0
Delaware	4	224	220	0	1	0	0	0	3	0
District of Columbia	17	790	780	0	9	0	1	0	0	0
Florida	94	4,238	4,209	1	18	1	3	0	4	2
Georgia	53	2,341	2,241	23	45	0	1	0	28	3
Hawaii	9	454	335	0	113	0	4	0	1	1
Idaho	6	117	117	0	0	0	0	0	0	0
Illinois	65	3,661	3,339	39	256	0	5	0	21	1
Indiana	20	1,015	997	0	0	0	8	0	8	2
Iowa	13	504	495	7	0	0	1	0	1	0
Kansas	11	374	369	2	0	0	1	0	2	0
Kentucky	17	707	694	6	0	0	2	0	5	0
Louisiana	53	1,868	1,832	5	23	0	7	0	1	0
Maine	5	200	196	0	3	0	1	0	0	0

See footnotes at end of table.

Table 19—Continued

Patients receiving care in-unit, by State: December 31, 1986

State	Facilities reporting	Total in-unit patients	Staff assisted dialysis		In-unit self-dialysis		Self-dialysis training			
			Hemo[1]	Peri[1]	Hemo[1]	Peri[1]	Hemo[1]	Peri[1]	CAPD[2]	CCPD[3]
Maryland	30	1,525	1,435	3	73	0	13	0	1	0
Massachusetts	27	1,670	1,624	13	24	0	4	0	5	0
Michigan	38	2,150	2,060	28	45	0	5	1	11	0
Minnesota	16	826	823	3	0	0	0	0	0	0
Mississippi	22	968	965	1	1	0	0	0	1	0
Missouri	37	1,364	1,300	3	49	0	9	0	3	0
Montana	4	108	104	0	2	0	1	0	1	0
Nebraska	9	242	238	4	0	0	0	0	0	0
Nevada	4	280	274	0	0	0	2	0	4	0
New Hampshire	4	153	151	0	2	1	0	0	0	0
New Jersey	27	2,775	2,471	126	137	0	16	0	19	6
New Mexico	13	414	414	0	0	0	0	0	0	0
New York	106	7,002	6,637	102	148	0	80	0	25	10
North Carolina	33	1,942	1,932	0	0	0	2	0	7	1
North Dakota	4	131	131	0	0	0	0	0	0	0
Ohio	43	2,674	2,649	13	6	0	3	0	3	0
Oklahoma	25	537	531	4	2	0	0	0	0	0
Oregon	9	406	395	0	1	0	4	0	6	0
Pennsylvania	84	4,002	3,869	35	79	0	8	1	10	0
Puerto Rico	14	1,099	1,083	12	0	0	4	0	0	0
Rhode Island	6	406	405	0	1	0	0	0	0	0
South Carolina	27	1,545	1,465	0	62	0	9	0	9	0
South Dakota	7	120	120	0	0	0	0	0	0	0
Tennessee	47	1,515	1,499	1	0	0	5	4	4	2
Texas	106	5,293	5,144	30	96	0	13	2	8	0
Utah	13	252	241	0	11	0	0	0	0	0
Vermont	1	46	38	0	6	0	2	0	0	0
Virgin Islands	2	20	20	0	0	0	0	0	0	0
Virginia	47	2,132	2,068	3	42	0	12	0	5	2
Washington	16	823	798	4	5	0	15	0	1	0
West Virginia	13	430	425	3	0	0	2	0	0	0
Wisconsin	25	748	706	10	28	0	1	0	3	0
Wyoming	1	20	20	0	0	0	0	0	0	0
American Samoa	1	13	13	0	0	0	0	0	0	0
Guam	1	42	38	0	3	0	1	0	0	0
Mariana Islands	1	18	18	0	0	0	0	0	0	0

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[1] Hemo is hemodialysis. Peri is peritoneal dialysis.

[2] Continuous ambulatory peritoneal dialysis.

[3] Continuous cycling peritoneal dialysis.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 20

Patients receiving care at home, by State: December 31, 1986

State	Facilities reporting	Total home patients	Hemodialysis	Peritoneal dialysis	CAPD[1]	CCPD[2]
Total	1,526	17,086	3,675	191	11,913	1,307
Alabama	31	388	74	2	286	26
Alaska	2	4	4	0	0	0
Arizona	27	301	24	3	259	15
Arkansas	20	215	45	4	145	21
California	186	1,074	157	4	764	149
Colorado	13	245	76	5	159	5
Connecticut	17	239	23	6	207	3
Delaware	4	46	8	0	37	1
District of Columbia	17	114	0	1	101	12
Florida	94	675	158	0	415	102
Georgia	53	499	68	1	392	38
Hawaii	9	74	26	0	31	17
Idaho	6	36	12	0	24	0
Illinois	65	475	69	0	370	36
Indiana	20	734	147	0	583	4
Iowa	13	233	59	1	152	21
Kansas	11	206	54	0	150	2
Kentucky	17	281	39	1	235	6
Louisiana	53	209	29	0	159	21
Maine	5	43	10	0	28	5
Maryland	30	291	47	3	206	35
Massachusetts	27	380	86	0	257	37
Michigan	38	850	79	12	742	17
Minnesota	16	240	118	2	110	10
Mississippi	22	315	147	0	164	4
Missouri	37	478	92	15	337	34
Montana	4	111	47	0	55	9
Nebraska	9	191	6	0	162	23
Nevada	4	73	16	0	54	3
New Hampshire	4	43	5	0	33	5
New Jersey	27	711	160	5	490	56
New Mexico	13	102	7	0	91	4
New York	106	1,343	360	1	933	49
North Carolina	33	649	121	9	405	114
North Dakota	4	25	2	0	23	0
Ohio	43	663	58	3	539	63
Oklahoma	25	187	30	0	138	19
Oregon	9	277	55	0	210	12
Pennsylvania	84	891	127	5	671	88
Puerto Rico	14	120	46	9	62	3
Rhode Island	6	29	3	0	25	1
South Carolina	27	158	37	0	101	20
South Dakota	7	12	0	0	8	4
Tennessee	47	501	140	54	297	10
Texas	106	854	153	24	555	122
Utah	13	103	59	0	38	6
Vermont	1	35	14	0	21	0
Virgin Islands	2	3	0	0	3	0
Virginia	47	406	86	2	278	40
Washington	16	516	424	18	68	6
West Virginia	13	117	16	0	96	5
Wisconsin	25	319	52	1	242	24
Wyoming	1	2	0	0	2	0
American Samoa	1	0	0	0	0	0
Guam	1	0	0	0	0	0
Mariana Islands	1	0	0	0	0	0

[1] Continuous ambulatory peritoneal dialysis.

[2] Continuous cycling peritoneal dialysis.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 21

Kidney transplant activity during the calendar year: United States, 1986

Category	Number
Transplants performed at center	8,976
Living donor	1,887
Cadaveric donor	7,089
Patients awaiting transplant	11,108
Dialysis	10,605
Nondialysis	503
Patients who received transplant at center	8,948
Medicare status	8,948
Medicare	7,782
Medicare pending	476
Non-Medicare	690

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 22

Disposition of cadaveric kidneys, by source: United States, 1986

		Disposition of cadaveric kidneys		
Source	Total	Transplanted at center	Sent to another center	Not used
Total	10,747	7,118	3,111	518
Harvested at center	2,799	1,357	1,264	178
Obtained from other center/organ procurement agency	3,926	3,335	486	105
Obtained from nontransplant hospital	4,022	2,426	1,361	235

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 23

Kidney transplant center patient eligibility status, by State: 1986

State	Centers reporting	Total transplant patients	Currently enrolled in Medicare	Medicare application pending	Non-Medicare
Total	185	8,948	7,782	476	690
Alabama	2	232	218	6	8
Arizona	4	142	126	2	14
Arkansas	2	30	29	0	1
California	16	1,117	880	73	164
Colorado	3	154	145	9	0
Connecticut	2	92	81	0	11
District of Columbia	5	211	133	13	65
Florida	4	316	287	8	21
Georgia	5	221	207	3	11
Hawaii	1	29	26	2	1
Illinois	8	360	335	11	14
Indiana	2	125	114	6	5
Iowa	3	76	76	0	0
Kansas	2	72	62	0	10
Kentucky	2	97	86	7	4
Louisiana	6	147	131	3	13
Maine	1	29	24	0	5
Maryland	3	94	88	0	6
Massachusetts	8	276	206	26	44
Michigan	9	352	329	2	21
Minnesota	3	301	267	26	8
Mississippi	1	30	30	0	0
Missouri	8	282	245	30	7
Nebraska	2	42	30	12	0
New Jersey	3	138	135	2	1
New Mexico	2	62	60	0	2
New York	13	607	521	23	63
North Carolina	5	207	202	3	2
Ohio	11	490	435	29	26
Oklahoma	4	91	78	13	0
Oregon	1	122	113	7	2
Pennsylvania	9	654	594	25	35
Puerto Rico	1	43	43	0	0
South Carolina	1	60	60	0	0
Tennessee	4	183	136	1	46
Texas	13	718	628	31	59
Utah	3	139	127	9	3
Vermont	1	18	18	0	0
Virgin Islands	1	0	0	0	0
Virginia	4	119	110	3	6
Washington	5	171	171	0	0
Wisconsin	2	299	196	91	12

NOTE: The following States have no Medicare-approved kidney transplant centers: Alaska, Delaware, Idaho, Montana, Nevada, New Hampshire, North Dakota, Rhode Island, South Dakota, West Virginia, Wyoming, American Samoa, Guam, and Mariana Islands.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Table 24

Number of kidney transplants performed and type of donor, by State: 1986

State	Centers reporting	Total patients	Total transplants	Type of donor Living donor	Cadaveric donor
Total	185	8,948	8,976	1,887	7,089
Alabama	2	232	232	62	170
Arizona	4	142	145	24	121
Arkansas	2	30	30	16	14
California	16	1,117	1,119	207	912
Colorado	3	154	154	27	127
Connecticut	2	92	92	20	72
District of Columbia	5	211	213	14	199
Florida	4	316	316	59	257
Georgia	5	221	221	89	132
Hawaii	1	29	31	2	29
Illinois	8	360	362	73	289
Indiana	2	125	125	28	97
Iowa	3	76	76	10	66
Kansas	2	72	72	6	66
Kentucky	2	97	97	19	78
Louisiana	6	147	148	27	121
Maine	1	29	29	7	22
Maryland	3	94	94	17	77
Massachusetts	8	276	276	83	193
Michigan	9	352	352	62	290
Minnesota	3	301	303	101	202
Mississippi	1	30	30	0	30
Missouri	8	282	282	69	213
Nebraska	2	42	42	0	42
New Jersey	3	138	138	8	130
New Mexico	2	62	62	12	50
New York	13	607	608	116	492
North Carolina	5	207	211	40	171
Ohio	11	490	494	100	394
Oklahoma	4	91	92	32	60
Oregon	1	122	122	33	89
Pennsylvania	9	654	656	71	585
Puerto Rico	1	43	43	22	21
South Carolina	1	60	60	15	45
Tennessee	4	183	183	60	123
Texas	13	718	719	154	565
Utah	3	139	139	32	107
Vermont	1	18	18	5	13
Virgin Islands	1	0	0	0	0
Virginia	4	119	119	16	103
Washington	5	171	171	56	115
Wisconsin	2	299	300	93	207

NOTE: The following States have no Medicare-approved kidney transplant centers: Alaska, Delaware, Idaho, Montana, Nevada, New Hampshire, North Dakota, Rhoda Island, South Dakota, West Virginia, Wyoming, American Samoa, Guam, and Mariana Islands.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the End Stage Renal Disease Facility Survey, 1986.

Veterans' Administration dialysis statistics

As of December 31, 1986, there were 57 Veterans' Administration dialysis centers and 23 Veterans' Administration satellite centers reporting the status of dialysis patients. The statistics displayed in Table 25 include 824 patients (excluding acute dialysis) who were dialyzing in 14 Medicare-approved Veterans' Administration facilities.

Data on the number of continuous ambulatory peritoneal dialysis (CAPD) patients are not captured as a separate category. However, it is presumed that a large portion of the 17 percent of peritoneal patients are on CAPD.

Approximately 1,075 patients, or 28 percent of the total Veterans' Administration dialysis population, are in the home setting.

Table 25

Number of patients for Veterans' Administration dialysis activities, by type of dialysis: 1985-86

Type of dialysis	Dialysis center patients	Satellite dialysis center patients December 1985	Contract fee	Dialysis center patients	Satellite dialysis center patients December 1986	Contract fee
All modalities	3,025	302	—	2,893	302	—
Acute hemodialysis	100	18	—	87	24	—
Acute peritoneal dialysis	7	1	—	5	0	—
Assisted hemodialysis	1,388	207	—	1,437	236	—
Assisted peritoneal dialysis	77	14	—	48	1	—
Limited hemodialysis	224	42	—	240	5	—
Limited peritoneal dialysis	8	0	—	3	0	—
Home self-hemodialysis training	36	1	—	27	1	—
Home self-peritoneal dialysis training	2	1	—	6	0	—
Home hemodialysis	610	8	—	488	15	—
Home peritoneal dialysis	573	10	—	552	20	—
Contract fee dialysis	—	—	664	—	—	658
Hemodialysis	—	—	638	—	—	624
Peritoneal dialysis	—	—	26	—	—	34

SOURCE: Veterans' Administration, Department of Medicine and Surgery; Data from the Division of Clinical Affairs, Medical Service Section, 1985-86.

Survival analyses

Program experience with respect to both patient and graft survival from onset of renal failure or from date of kidney transplant to 3 years subsequent is discussed in this section. The analysis covers the period from January 1, 1982 through January 31, 1985. All Medicare beneficiaries with renal failure occurring on or after January 1, 1982 through December 31, 1985 were included in the analysis of dialysis survival. The transplant survival analysis included Medicare beneficiaries whose transplants occurred on or after January 1, 1982 through December 31, 1985. The total number of persons included in the computation of dialysis patient survival was 101,279. The total number of transplants included in the computation of transplant survival was 23,724.

Data

Computation of survival rates for dialysis patients requires a date of renal onset and a date of death. Computation of survival rates for transplantation both patient survival and graft survival, requires the date of transplantation, date of graft failure, and date of death. Dates of death were taken from the Master Beneficiary Records that are maintained for all Medicare beneficiaries. The determination of renal failure onset was defined as the date of first dialysis and was taken from the patient medical evidence record (HCFA-2728), the outpatient dialysis record (HCFA-1483 or HCFA-1450), or was estimated from the entitlement records. The date of transplant was taken from the transplant form (HCFA-2745) or from the inpatient hospital bill (HCFA-1453 or HCFA-1450). The date of transplant failure was taken from the transplant followup form or was calculated based on a record of outpatient dialysis sessions or was based on a date of retransplantation.

Survival rates were calculated using a standard actuarial modified life-table analysis. For dialysis patients, survival was measured from date of renal failure onset until death with right censoring[2] for transplantation or the end of the observation period (December 31, 1986). For transplants, patient survival was measured from date of transplantation until death with right censoring[2] for the end of the observation period. Graft survival for transplants was measured from date of transplantation until graft failure date or date of death with right censoring for the end of the observation period.

Results

The results of the analysis of dialysis patient survival are presented in Table 26. At 1 year following renal failure onset, 78.2 percent of patients were still alive. At 2 years this had decreased to 62.5 percent and at 3 years, 50.1 percent. There were notable differences by age group. Persons less than 25 years of age (at the time of renal failure) had a 1-year survival of over 95 percent and a 3-year survival rate of over 85 percent. The rate of survival decreased for each older age cohort. For those 75 years of age or over, 1-year survival was only 57.7 percent and less than one-quarter (23.0 percent) could be expected to survive 3 years. At 3 years, females have a cumulative survival rate 2 percent greater than do males (51.1 percent and 49.1 percent, respectively).

Among racial groups, the highest survival is found in black persons (84.6 percent at 1 year and 59.8 percent at 3 years). Asian persons and American Indians have survival rates slightly below that of black persons. The lowest survival on dialysis is found among white persons with 1-year survival of 76.3 percent at 1 year and 47.2 percent at 3 years. The average age of white persons on dialysis is greater than for the other race groups. This explains part, but not all, of the racial difference in dialysis survival.

By reported cause of renal failure, the lowest survival rates are for those whose renal failure was attributed to diabetes (39.1 percent at 3 years) and hypertension (48.8 percent at 3 years). Persons whose renal failure is attributed to glomerulonephritis have a 3-year survival rate of 63.0 percent and persons whose renal failure is attributed to polycystic kidney disease have a 3-year survival rate of 74.1 percent.

Patient survival rates for persons with cadaver transplants and living-related donor transplants are presented in Tables 27 and 28, respectively. Among cadaver transplant recipients, 1-, 2-, and 3-year patient survival rates are 90.6 percent, 85.9 percent, and 81.1 percent, respectively. Patient survival decreases with advancing age, with 3-year survival rates of 89 percent for persons less than 25 years old, falling to 68 percent for persons ages 65-74. Females had 3-year survival rates about 2 percent greater than males (82.7 percent and 80.2 percent, respectively). White persons, black persons, and Asian persons all had 3-year survival rates of about 82 percent. Patient survival was lower among American Indians at 77.9 percent. Persons whose renal failure was attributed to glomerulonephritis had the highest 3-year survival rate at 86.7 percent and persons with diabetes had the lowest 3-year survival rate at 68.7 percent.

Among living-related donor transplant recipients, 1-, 2-, and 3-year patient survival rates were 95.8 percent, 93.7 percent, and 91.1 percent, respectively.

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[2] Right censoring is a technique for handling cases in which the person is still alive at the end of the observation period. The life table calculation stop at the right censor date for these persons. However, unlike a withdrawal because of death, there is no increment to the number of deaths.

Table 26

Dialysis patient survival by age, sex, race, and primary disease: 1982-85

Age, sex, race, and primary disease	Total	Percent surviving 1 year	2 years	3 years
All persons	101,279	78.2 (0.1)	62.5 (0.2)	50.1 (0.2)
Age				
Under 15 years	1,652	95.2 (0.6)	91.3 (1.0)	89.0 (1.3)
15-24 years	4,566	95.1 (0.4)	90.2 (0.6)	86.7 (0.8)
25-34 years	10,120	91.5 (0.3)	82.4 (0.5)	74.1 (0.7)
35-44 years	11,710	89.7 (0.3)	79.2 (0.4)	69.7 (0.6)
45-54 years	15,194	86.5 (0.3)	73.3 (0.4)	62.1 (0.5)
55-64 years	23,831	79.3 (0.3)	63.4 (0.3)	50.5 (0.4)
65-74 years	23,234	67.3 (0.3)	48.6 (0.3)	35.2 (0.4)
75 years and over	10,972	57.7 (0.4)	36.8 (0.5)	23.0 (0.5)
Sex				
Male	55,857	77.8 (0.2)	61.7 (0.2)	49.1 (0.3)
Female	45,422	78.6 (0.2)	63.4 (0.2)	51.1 (0.3)
Race				
White	63,656	76.3 (0.2)	59.9 (0.2)	47.2 (0.3)
Black	25,975	84.6 (0.2)	71.1 (0.3)	59.8 (0.4)
Asian	1,476	83.5 (1.0)	70.3 (1.3)	56.1 (1.7)
American Indian	966	83.2 (1.2)	68.0 (1.6)	54.6 (2.0)
Other/unknown	9,206	70.8 (0.5)	53.2 (0.6)	39.9 (0.6)
Primary disease				
Diabetes	25,743	74.3 (0.3)	53.9 (0.3)	39.1 (0.4)
Hypertension	24,348	76.4 (0.3)	61.0 (0.3)	48.8 (0.4)
Glomerulonephritis	22,382	85.4 (0.3)	73.4 (0.3)	63.0 (0.4)
Polycystic kidney disease	4,244	92.2 (0.4)	83.9 (0.6)	74.1 (0.9)
Other/unknown	24,562	75.1 (0.3)	59.8 (0.3)	47.6 (0.4)

NOTE: Numbers in parentheses represent the standard error of the estimate for each value.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1982-85.

Three-year patient survival rates ranged from a high of 95.8 percent for persons 15-24 years of age, to 77.2 percent for persons 55-64 years of age. Males and females had comparable 3-year survival rates of about 91 percent. Asian persons had the highest 3-year survival rate of 93.3 percent, followed by white persons and American Indians (91.6 percent) and black persons (86.8 percent). By cause of renal failure, persons whose renal failure was attributed to either glomerulonephritis or polycystic kidney disease had 3-year survival rates over 95 percent. Survival for persons with hypertension was 89.0 percent; and for persons with diabetes, survival was 80.7 percent.

Kidney graft survival rates for persons with cadaver transplants and living-related donor transplants are presented in Tables 29 and 30, respectively. Among cadaver donor recipients, about two-thirds of the kidney grafts survived for at least 1 year (66.2 percent). At 2 years, 58.5 percent still survived, and at 3 years just over one-half (52.1 percent) were still functioning. There was little difference in graft survival across age and sex groups with almost all groups having 3-year survival rates of about 50 percent. Asian and white cadaver transplant recipients had 3-year graft survival rates of 55.8 percent and 54.3 percent, respectively. Lower graft survival rates were experienced by black recipients (44.6 percent) and American Indian recipients (41.3 percent). There were small differences in graft survival by primary disease category with persons with glomerulonephritis (54.3 percent) and polycystic kidney disease (56.8 percent) having higher survival rates than persons with hypertension (49.1 percent) and diabetes (48.9 percent).

Among persons receiving a transplant from a living-related donor, 1-, 2-, and 3-year graft survival rates were 86.4 percent, 81.0 percent, and 77.1 percent, respectively. As with cadaver transplant recipients, there were not great differences by age group. However, the youngest group (ages less than 15) and the oldest age group had the lowest survival rates. Females had a slightly higher survival rate (78.8 percent) than did males (76.1 percent). Differences by race group were quite high ranging from a high of 85.5 percent among Asian persons to a low of 64.1 percent among black persons. By primary disease category, 3-year graft survival rates were highest for persons whose renal failure was attributed to polycystic kidney diesase (81.3 percent) or glomerulonephritis (78.3 percent) and lowest for persons whose renal failure was attributed to either hypertension (72.5 percent) or diabetes (70.7 percent).

Table 27

Cadaver transplant patient survival, by age, sex, race, and primary disease: 1982-85

Age, sex, race, and primary disease	Total	Percent surviving		
		1 year	2 years	3 years
All persons	17,229	90.6 (0.2)	85.9 (0.3)	81.1 (0.4)
Age				
Under 15 years	657	95.1 (0.9)	92.9 (1.1)	89.1 (1.7)
15-24 years	2,106	95.2 (0.5)	92.4 (0.7)	89.0 (1.0)
25-34 years	4,435	93.0 (0.4)	89.2 (0.5)	84.7 (0.8)
35-44 years	4,764	90.7 (0.5)	85.5 (0.6)	80.3 (0.8)
45-54 years	3,577	87.2 (0.6)	81.6 (0.8)	76.7 (1.0)
55-64 years	1,562	83.4 (1.0)	75.9 (1.3)	68.0 (1.8)
65-74 years	120	77.5 (4.5)	73.3 (5.2)	67.9 (7.1)
75 years and over	8	—	—	—
Sex				
Male	10,957	90.5 (0.3)	85.8 (0.4)	80.2 (0.5)
Female	6,272	90.6 (0.4)	86.1 (0.5)	82.7 (0.7)
Race				
White	11,580	90.8 (0.3)	86.5 (0.4)	82.1 (0.5)
Black	3,762	91.8 (0.5)	87.2 (0.7)	82.3 (0.9)
Asian	288	89.0 (2.0)	84.7 (2.5)	82.3 (2.9)
American Indian	140	90.2 (2.7)	86.1 (3.5)	77.9 (5.5)
Other/unknown	1,459	86.2 (0.9)	80.1 (1.1)	74.3 (1.2)
Primary disease				
Diabetes	2,705	85.6 (0.7)	77.3 (1.0)	68.7 (1.4)
Hypertension	2,185	90.2 (0.7)	85.3 (0.9)	79.6 (1.2)
Glomerulonephritis	5,358	93.4 (0.4)	90.3 (0.5)	86.7 (0.7)
Polycystic kidney disease	1,171	89.4 (1.0)	86.0 (1.2)	83.0 (1.5)
Other/unknown	5,822	90.6 (0.4)	85.8 (0.5)	81.4 (0.7)

NOTE: Numbers in parentheses represent the standard error of the estimate for each value.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1982-85.

Table 28

Living-related donor transplant patient survival, by age, sex, race, and primary disease: 1982-85

Age, sex, race, and primary disease	Total	Percent surviving		
		1 year	2 years	3 years
All persons	6,495	95.8 (0.3)	93.7 (0.3)	91.1 (0.5)
Age				
Under 15 years	657	97.4 (0.7)	96.1 (0.9)	93.9 (1.3)
15-24 years	1,422	97.8 (0.4)	97.0 (0.5)	95.8 (0.7)
25-34 years	2,150	96.9 (0.4)	95.1 (0.5)	92.4 (0.8)
35-44 years	1,283	94.1 (0.7)	91.4 (0.9)	87.7 (1.2)
45-54 years	740	92.5 (1.0)	88.2 (1.4)	85.5 (1.7)
55-64 years	232	88.0 (2.3)	83.8 (2.8)	77.2 (3.6)
65-74 years	11	—	—	—
75 years and over	0	—	—	—
Sex				
Male	3,957	96.1 (0.3)	94.0 (0.4)	91.0 (0.6)
Female	2,538	95.2 (0.5)	93.3 (0.6)	91.2 (0.7)
Race				
White	5,074	96.3 (0.3)	94.4 (0.4)	91.6 (0.5)
Black	738	93.4 (1.0)	90.8 (1.2)	86.8 (1.7)
Asian	94	94.9 (2.5)	93.3 (2.9)	93.3 (2.9)
American Indian	70	91.6 (3.6)	91.6 (3.6)	91.6 (3.6)
Other/unknown	519	94.5 (1.0)	92.0 (1.2)	90.3 (1.3)
Primary disease				
Diabetes	1,145	91.3 (0.9)	86.2 (1.2)	80.7 (1.6)
Hypertension	496	95.3 (1.0)	92.7 (1.3)	89.0 (1.9)
Glomerulonephritis	2,207	97.6 (0.3)	96.7 (0.4)	95.4 (0.6)
Polycystic kidney disease	234	97.1 (1.2)	96.4 (1.4)	96.4 (1.4)
Other/unknown	2,336	96.1 (0.4)	94.4 (0.5)	91.7 (0.8)

NOTE: Numbers in parentheses represent the standard error of the estimate for each value.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1982-85.

Table 29

Cadaver transplant graft survival in patients, by age, sex, race, and primary disease: 1982-85

Age, sex, race, and primary disease	Total	Percent surviving 1 year	2 years	3 years
All persons	17,229	66.2 (0.4)	58.5 (0.4)	52.1 (0.5)
Age				
Under 15 years	657	59.3 (2.0)	49.1 (2.3)	42.1 (2.7)
15-24 years	2,106	67.2 (1.1)	59.5 (1.2)	52.5 (1.5)
25-34 years	4,435	67.8 (0.7)	60.2 (0.8)	53.8 (1.0)
35-44 years	4,764	65.8 (0.7)	58.4 (0.8)	52.5 (1.0)
45-54 years	3,577	65.7 (0.9)	58.4 (1.0)	52.3 (1.1)
55-64 years	1,562	65.6 (1.3)	56.6 (1.5)	49.1 (1.9)
65-74 years	120	58.4 (5.3)	53.9 (5.8)	53.9 (5.8)
75 years and over	8	—	—	—
Sex				
Male	10,957	66.2 (0.5)	58.4 (0.5)	51.8 (0.7)
Female	6,272	66.1 (0.6)	58.6 (0.7)	52.6 (0.9)
Race				
White	11,580	67.5 (0.5)	60.5 (0.5)	54.3 (0.7)
Black	3,762	62.2 (0.9)	52.0 (1.0)	44.6 (1.2)
Asian	288	65.7 (3.0)	59.0 (3.3)	55.8 (3.8)
American Indian	140	69.9 (4.2)	57.2 (5.1)	41.3 (6.7)
Other/unknown	1,459	65.9 (1.3)	58.4 (1.3)	53.4 (1.4)
Primary disease				
Diabetes	2.705	65.1 (1.0)	56.6 (1.2)	48.9 (1.4)
Hypertension	2,185	65.9 (1.1)	56.3 (1.3)	49.1 (1.5)
Glomerulonephritis	5,358	68.0 (0.7)	60.9 (0.8)	54.3 (0.9)
Polycystic kidney disease	1,171	66.5 (1.5)	60.3 (1.6)	56.8 (1.9)
Other/unknown	5,822	65.0 (0.7)	57.4 (0.7)	51.6 (0.8)

NOTE: Numbers in parentheses represent the standard error of the estimate for each value.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1982-85.

Table 30

Living-related donor transplant graft survival of patients by age, sex, race, and primary disease: 1982-85

Age, sex, race, and primary disease	Total	Percent surviving 1 year	2 years	3 years
All persons	6,495	86.4 (0.5)	81.0 (0.6)	77.1 (0.7)
Age				
Under 15 years	657	82.3 (1.6)	75.3 (1.9)	70.1 (2.4)
15-24 years	1,422	88.9 (0.9)	82.6 (1.1)	79.4 (1.3)
25-34 years	2,150	88.2 (0.7)	83.5 (0.9)	79.0 (1.1)
35-44 years	1,283	84.4 (1.1)	79.8 (1.3)	77.2 (1.4)
45-54 years	740	85.3 (1.4)	78.7 (1.7)	75.2 (2.0)
55-64 years	232	80.0 (2.8)	77.2 (3.1)	71.5 (3.7)
65-74 years	11	—	—	—
75 years and over	0	—	—	—
Sex				
Male	3,957	86.4 (0.6)	80.4 (0.7)	76.1 (0.9)
Female	2,538	86.4 (0.7)	81.9 (0.9)	78.8 (1.0)
Race				
White	5,074	87.4 (0.5)	82.2 (0.6)	77.7 (0.8)
Black	738	77.3 (1.6)	68.7 (2.0)	64.1 (2.3)
Asian	94	90.5 (3.2)	85.5 (4.1)	85.5 (4.1)
American Indian	70	82.9 (4.8)	78.2 (5.5)	78.2 (5.5)
Other/unknown	519	89.2 (1.4)	84.8 (1.6)	83.4 (1.7)
Primary disease				
Diabetes	1,145	83.0 (1.2)	76.5 (1.4)	70.7 (1.8)
Hypertension	496	86.3 (1.6)	76.8 (2.2)	72.5 (2.6)
Glomerulonephritis	2,207	87.1 (0.7)	81.8 (0.9)	78.3 (1.1)
Polycystic kidney disease	234	88.5 (2.2)	87.1 (2.4)	81.8 (3.4)
Other/unknown	2,336	87.1 (0.7)	82.6 (0.9)	79.5 (1.0)

NOTE: Numbers in parentheses represent the standard error of the estimate for each value.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1982-85.

Utilization

Medicare inpatient hospital use

In 1985, there were 107,697 Medicare end stage renal disease (ESRD) beneficiaries who were eligible for Medicare benefits for at least part of the year. The analysis that follows considers inpatient utilization separately for each of the patient groups presented.

Persons on dialysis for the entire eligible year

Persons on dialysis for the entire eligible year numbered 82,422 and comprised 76.5 percent of all Medicare ESRD beneficiaries. Distribution of these patients by age with the number of inpatient days and discharges associated with each group is shown in Table 31. This group is older than the total ESRD beneficiary population with 56 percent 55 years of age or older. This dialysis population was hospitalized 100,122 times and accounted for 875,024 days of inpatient care. This utilization resulted in a discharge rate per 1,000 beneficiaries of 1,215, a days of care rate per 1,000 beneficiaries of 10,616, and an average length of stay per discharge of 8.7 days. With the exception of the youngest age group (0-14 years of age), there was a direct relationship between age and inpatient use. Compared with persons 15-24 years of age, persons 65 years of age and over were hospitalized 49 percent more often (949 discharges per 1,000 and 1,410 discharges per 1,000, respectively) and spent 97 percent more days as an inpatient (6,886 days per 1,000 and 13,568 per 1,000, respectively.)

Persons receiving a transplant in 1985

In 1985, there were 6,432 Medicare beneficiaries who received a kidney transplant. They accounted for 6.0 percent of the entire Medicare ESRD beneficiary population. The utilization of inpatient care by this population is shown in Table 32. In contrast to the dialysis population, the transplant population is younger, with only 9.8 percent 55 years of age or older. Because of the transplant stay itself and associated inpatient stays both before and after the transplant stay, this population experiences high hospitalization rates. The 6,432 persons in this group had 14,022 hospitalizations and were hospitalized for a total of 171,518 days. This utilization resulted in a discharge rate of 2,180 discharged per 1,000 beneficiaries and a days of care rate of 36,666 days per 1,000 beneficiaries. The lowest discharge and days of care rates were experienced by the youngest age group, persons 0-14 years of age. For the

Table 31

Discharge rates for Medicare dialysis patients, by days of care rates, average length of stay, and age: 1985

Age	Number of patients	Number of inpatient days	Number of inpatient discharges	Discharges per 1,000 persons	Days per 1,000 persons	Average length of stay
Total	82,422	875,024	100,122	1,215	10,616	8.7
Under 15 years	607	4,220	504	830	6,952	8.4
15-24 years	2,753	18,957	2,613	949	6,886	7.3
25-34 years	7,930	63,423	8,221	1,037	7,998	7.7
35-44 years	10,951	91,596	11,486	1,049	8,364	8.0
45-54 years	13,828	130,712	15,858	1,147	9,453	8.2
55-64 years	20,954	221,515	25,628	1,223	10,571	8.6
65 years and over	25,399	344,601	35,812	1,410	13,568	9.6

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1985.

Table 32

Discharge rates for Medicare kidney transplant patients, by days of care rates, average length of stay, and age: 1985

Age	Number of patients	Number of inpatient days	Number of inpatient discharges	Discharges per 1,000 persons	Days per 1,000 persons	Average length of stay
Total	6,432	171,518	14,022	2,180	26,666	12.2
Under 15 years	313	6,778	545	1,741	21,655	12.4
15-24 years	856	21,009	1,792	2,093	24,543	11.7
25-34 years	1,632	43,684	3,681	2,256	26,767	11.9
35-44 years	1,741	49,401	3,966	2,278	28,375	12.5
45-54 years	1,259	33,678	2.696	2,141	26,750	12.5
55-64 years	572	15,203	1,198	2,094	26,579	12.7
65 years and over	59	1,765	144	2,441	29,915	12.3

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1985.

remaining persons there was not much difference in utilization by age group.

Persons receiving a transplant in a year prior to 1985, with a functioning graft throughout 1985

This group of persons represents the successful transplants from previous years. The 17,926 persons in this group accounted for 16.6 percent of all Medicare ESRD beneficiaries in 1985 (up from 13.6 percent in 1984). Table 33 presents the inpatient utilization for this patient population. The age distribution for this group is similar to that of persons transplanted in 1985. Fifty-six percent of these persons are between the ages 25-44. The utilization of inpatient care is much less for this group than for either dialysis or transplant patients. This group was hospitalized 11,551 times for a total of 97,316 days. This utilization amounts to a discharge rate of 644 per 1,000 beneficiaries and a days of care rate of 5,429 per 1,000 beneficiaries. With the exception of the youngest and oldest age groups, in which there were few patients, there was a direct relationship between inpatient use and age. Persons 55-64 years of age were hospitalized 38 percent more often than persons age 15-24 (750 discharges per 1,000 and 543 discharges per 1,000 respectively) and experienced 65 percent more inpatient days (6,635 days per 1,000 and 4,020 days per 1,000, respectively).

Persons receiving a transplant in a year prior to 1985, with a kidney graft failure in 1985

The final group of ESRD beneficiaries represents those persons who received a kidney transplant before 1985 and experienced a graft failure in 1985. There were 917 of these persons, representing 0.9 percent of the total Medicare ESRD beneficiary population. Presented in Table 34 are the inpatient utilization rates for these persons. As shown in the table the rejection of a transplant is associated with a high rate of hospitalization. These persons accounted for 2,301 hospitalizations and a total of 20,373 inpatient days. This utilization amounts to a discharge rate of 2,509 discharges per 1,000 beneficiaries and a days of care rate of 22,217 per 1,000 beneficiaries. There is little relationship between age and utilization in this patient population with more age groups experiencing discharge rates of greater than 2,000 per 1,000 beneficiaries and days of care rates greater than 20,000 per 1,000 beneficiaries.

Table 33

Discharge rates for Medicare functioning kidney graft patients, by days of care rates, average length of stay, and age: 1985

Age	Number of patients	Number of inpatient days	Number of inpatient discharges	Discharges per 1,000 persons	Days per 1,000 persons	Average length of stay
Total	17,926	97,316	11,551	644	5,429	8.4
Under 15 years	613	2,863	364	594	4,670	7.9
15-24 years	2,306	9,270	1,253	543	4,020	7.4
25-34 years	5,163	26,149	3,170	614	5,065	8.2
35-44 years	4,832	27,918	3,256	674	5,778	8.6
45-54 years	3,239	19,470	2,187	675	6,011	8.9
55-64 years	1,612	10,696	1,209	750	6,635	8.8
65 years and over	161	950	112	696	5,901	8.5

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1985.

Table 34

Discharge rates for Medicare kidney graft failure patients, by days of care rates, average length of stay, and age: 1985

Age	Number of patients	Number of inpatient days	Number of inpatient discharges	Discharges per 1,000 persons	Days per 1,000 persons	Average length of stay
Total	917	20,373	2,301	2,509	22,217	8.9
Under 15 years	38	708	81	2,132	18,632	8.7
15-24 years	150	3,247	370	2,467	21,647	8.8
25-34 years	250	5,714	673	2,692	22,856	8.5
35-44 years	233	5,517	614	2,635	23,678	9.0
45-54 years	171	3,420	384	2,246	20,000	8.9
55-64 years	71	1,727	176	2,479	24,324	9.8
65 years and over	4	40	3	750	10,000	13.3

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1985.

Hospitalization for ancillary problems

For this report, ancillary hospitalizations are defined as all hospitalizations other than transplants. This is a necessary simplification because many hospitalizations are related to the transplant event, either before the actual transplant or afterward, such as rejection episodes. However, it is not possible to completely identify the hsopital stays that are transplant "related." Therefore, the nontransplant stays of transplant patients are considered to be ancillary hospitalizations.

Data

The basis data were taken from the 1983 Medicare Provider Analysis and Review File (MEDPAR), which is a 20-percent sample of hospital stays and discharges of all Medicare beneficiaries, as well as diagnostic and procedure coding. This sample of stays includes procedure coding so it was possible to determine average charges and length of stay for transplant and nontransplant stays. The 1983 MEDPAR contained a slight shortfall (about 1 percent) at the time of this analysis. Thus, the figures were adjusted upward to approximate costs for 100 percent of stays. Hospital covered charges and covered days of care were estimated directly from the MEDPAR records.

Results

In Table 35 are summarized the results of this analysis. In 1983, Medicare end stage renal disease (ESRD) patients had a total a 112,502 discharges. Of the total discharges, 53 percent were nonsurgical, 42 percent included a surgical procedure other than transplant, and the remaining 5 percent were for transplants.

Inpatient charges amount to about $853 million for this population. Because of the relatively high cost of transplant stays, over one-fifth (22 percent) of all inpatient charges were for transplant stays. Overall, the average charge per stay for the ESRD population in 1983 was $7,584. The average transplant stay had a charge of $33,693, while the average ancillary (i.e., nontransplant) hospital stay had a charge of $6,212. Of the total ancillary stays, the average for surgical stays was $9,268.

Medicare reimbursements are not equal to hospital charges. Applying the national ratio of Medicare reimbursements to charges gives an estimate of the costs to Medicare for ESRD hospitalizations. In 1983, the interim cost to charges ratio was .649. That is, Medicare paid hospitals an average of 64.9 percent of charges. For all ESRD patients, estimated Medicare inpatient hospital payments were $554 million in 1983; $123 million for transplants, and $431 million for nontransplant (or ancillary) stays.

As noted earlier, nonsurgical stays comprised 53 percent of all stays, whereas the nontransplant surgical stays were 42 percent of the total. However, because of the higher costs of surgical stays, the nontransplant surgical stays accounted for 52 percent of all reimbursements. The estimated Medicare reimbursements per stay are $4,922 for all discharges, $21,867 for transplants, and $4,032 for all nontransplant stays. Among nontransplant stays, nonsurgical stays averaged $2,432 and surgical stays averaged $6,015.

Table 35

Charges, estimated reimbursements, and average length of stay for transplant and nontransplant hospital stays by selected characteristic: 1983

Characteristic	All stays	Transplant stays	Nontransplant stays		
			All	Nonsurgical	Surgical
Number of stays	112,502	5,616	106,886	59,158	47,728
Percent	100	5	95	53	42
Charges in thousands	$853,215	$189,220	$663,995	$221,648	$442,347
Percent	100	22	78	26	52
Charges	$7,584	$33,693	$6,212	$3,747	$9,268
Estimated reimbusement in thousands	$553,737	$122,804	$430,933	$143,850	$287,083
Percent	100	22	78	26	52
Estimated reimbursement per stay	$4,922	$21,867	$4,032	$2,432	$6,015
Covered days	1,210,234	151,070	1,059,164	515,059	544,104
Percent	100	12	88	43	45
ALOS[1]	10.8	26.9	9.9	8.7	11.4

[1] Average length of stay.

NOTE: MEDPAR is Medicare Provider Analysis and Review File.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the 1983 MEDPAR 20-percent sample of hospital stays, and Program Management and Medical Information System.

Providers of renal care

This section discusses the growth in the number of participating renal providers furnishing some form of end stage renal disease (ESRD) treatment. For the purpose of this report, all providers furnishing dialysis are called facilities and all hospitals approved to do transplants are called transplant centers.

Growth in numbers and types of providers

The ESRD program began in 1973. The total number of Medicare-approved renal providers has risen 260 percent, from 606 in 1973 to 1,578 in December 1986 (Figure 1).

The growth in the number of renal dialysis facilities has been primarily among freestanding facilities, i.e., facilities not affiliated with hospitals. In 1973, freestanding facilities represented about one out of nine renal facilities (11.2 percent); hospital units or hospital satellites made up the remaining eight out of nine (88.8 percent). By the end of 1986, more than one of every two renal facilities (57 percent) was freestanding.

Ownership or control

In 1986, more than four out of every ten (47 percent) renal facilities were proprietary and were almost exclusively freestanding (Table 36). Proprietary facilities represent an increasing proportion of all facilities. Nonprofit renal facilities are mainly hospital owned and operated.

Type of renal care provided

In 1986, close to 8,976 renal transplants were performed in 185 renal hospital units called "transplant centers." (A total of 184 units were actually approved to perform transplants.) All but 35 of these transplant centers also provide outpatient dialysis services (Table 37).

Patients not receiving kidney transplants receive dialysis care either at home or at one of the 1,500 renal facilities providing dialysis services. Of this number, 998 are "dialysis facilities," which means they are approved to furnish at least one dialysis service. These facilities may be in either a hospital (137) or nonhospital (861) setting.

Another 502 locations are called "dialysis centers." These are hospital units which, in addition to providing dialysis service(s), are also approved to furnish the full spectrum of diagnostic, therapeutic, and rehabilitative services. Of the total number of dialysis centers, 149 are also transplant centers.

Finally, 43 renal dialysis centers are defined as "inpatient care" centers because they provide backup dialysis services only, and 20 percent or less of their dialysis is performed on an outpatient basis.

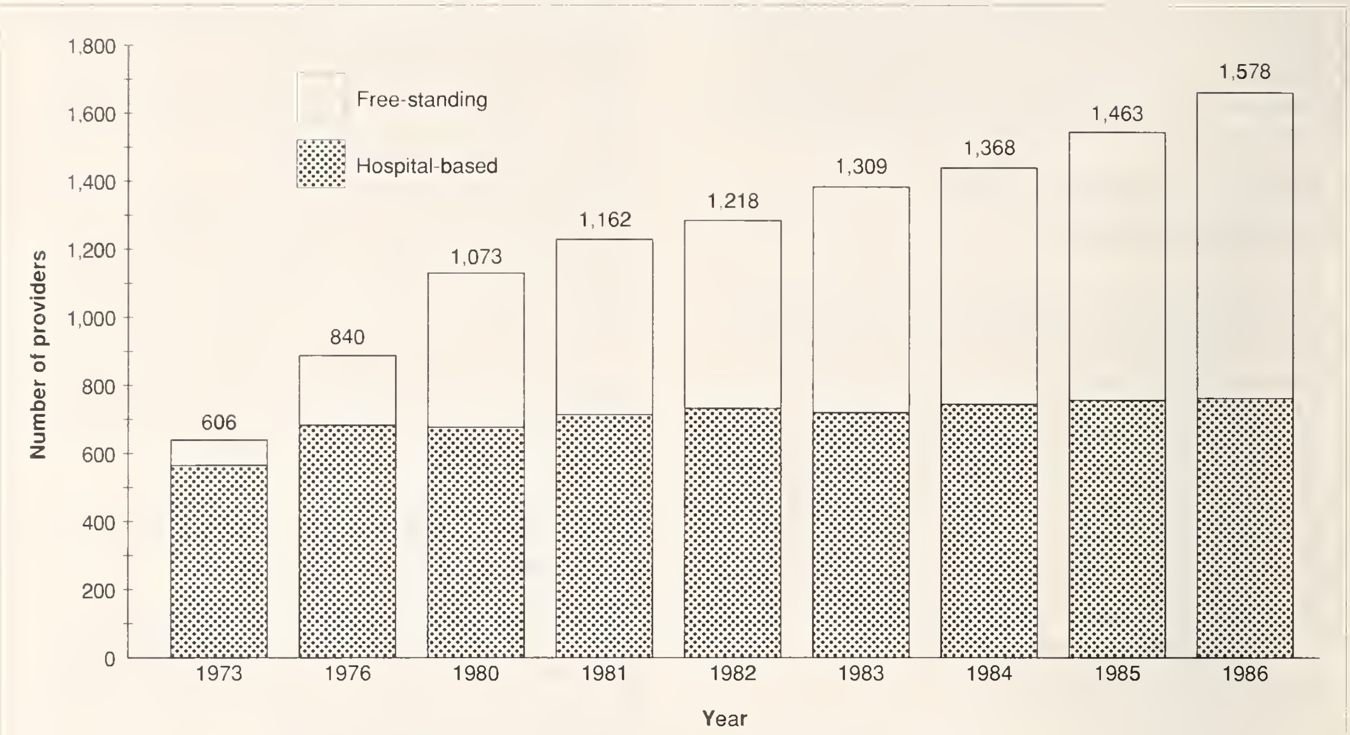
Regional comparison—renal dialysis facilities and populations

Across the country there is over a threefold variation in the proportion of all facilities that are freestanding, from a low of 29 percent in the New York region (Appendix D regional map) to a high of 83 percent in the Atlanta region.

Most of the services and supplies needed by people with permanent kidney failure are covered only by supplementary medical insurance (SMI); e.g., outpatient maintenance dialysis, self-dialysis training, and home dialysis. SMI is the part of Medicare that pays for these dialysis sessions, which are the majority of services received by ESRD beneficiaries not receiving a transplant.

A dialysis station is a treatment area within a facility, designed and equipped to provide adequate and safe dialysis therapy, as well as privacy and comfort for patients. Those regions such as the Seattle region with low outpatient dialysis stations may have a high home dialysis population.

Figure 1
Number of Medicare end stage renal disease providers, hospital-based versus free-standing: Selected years, 1973-86



SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, 1973-86

Table 36
Number and percent of certified end stage renal disease providers, by type of ownership: 1983-86

	1983		1984		1985		1986	
Type of ownership	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	1,309	100.0	1,368	100.0	1,463	100.0	1,578	100.0
Proprietary	504	38.5	552	40.4	616	42.1	715	45.3
Hospital-based	14	1.1	23	1.7	26	1.8	24	1.5
Freestanding	490	37.4	529	38.7	590	40.3	691	43.8
Nonprofit	805	61.5	816	59.6	847	57.9	863	54.7
Hospital-based	668	51.0	677	49.4	689	47.1	693	43.9
Freestanding	137	10.5	139	10.2	158	10.0	170	10.8

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Information System, 1983-86.

Table 37

Number of certified end stage renal disease providers of service, type of service, and number of approved dialysis stations, by region: December 1986

Region	Total providers of service[1]	Hospital transplant centers	Outpatient dialysis facilities			Inpatient hospital dialysis centers	Approved dialysis stations total	Facilities training in self-dialysis
			Total	Hospital	Freestanding			
All regions	1,578	184	1,500	639	861	43	19,383	1,063
Boston	59	12	59	40	19	0	706	54
New York	151	18	150	107	43	0	1,868	101
Philadelphia	204	21	196	79	117	8	2,629	145
Atlanta	329	24	318	53	265	7	4,655	196
Chicago	216	35	202	142	60	11	2,684	160
Dallas	230	27	213	70	143	4	2,702	140
Kansas City	71	15	67	41	26	3	743	64
Denver	40	6	38	25	13	0	384	29
San Francisco	241	20	224	64	160	9	2,734	156
Seattle	37	6	33	18	15	1	278	18

[1] Categories do not add to total because some hospital transplant centers also provide outpatient services and are counted again in that category.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the Program Management and Medical Information System, Dec. 1986.

End stage renal disease studies

Centers for Disease Control survey

The Centers for Disease Control (CDC) annually surveys dialysis facilities using their Form 53.7, "National Surveillance of Dialysis Associated Hepatitis and Other Diseases." The CDC form is mailed by the Health Care Financing Administration to Medicare dialysis facilities along with the HCFA-2744, End State Renal Disease Facility Survey. As CDC surveys are received, they are forwarded to CDC for appropriate analyses.

Following is an explanation of the contents of the report entitled, "National Surveillance of Dialysis-Associated Hepatitis and Other Diseases in the United States, 1986."

National Surveillance of Dialysis-Associated Hepatitis and Other Diseases in the United States, 1986

by Miriam J. Alter, Ph.D. and
Martin S. Favero, Ph.D.

"In conjunction with the annual facility survey performed by the Health Care Financing Administration (HCFA) for calendar year 1986, the Centers for Disease Control (CDC) distributed by mail a questionnaire to all 1,520 chronic hemodialysis centers currently operating and licensed by HCFA. The reported incidence and prevalence of hepatitis B virus (HBV) infection among patients and staff was measured by using hepatitis B surface antigen (HBsAg) and antibody to HBsAg (anti-HBs) as markers. Incidence was defined as the percentage of patients or staff present in the facility for at least 1 month in 1986 who became positive for HBsAg during 1986. Prevalence was defined as the percentage of patients or staff present in the facility during the first week of December 1986 who were positive for HBsAg or for anti-HBs. Estimates of the cumulative number of patients and staff members susceptible to HBV (eligible for hepatitis B vaccine) were obtained by subtracting the number of patients and staff members positive for HBsAg and anti-HBs reported in a similar survey performed in 1982 (prior to nationwide use of vaccine) from the total number of patients and staff members reported in 1986. Other data collected included:

-management of HBsAg-positive patients;
-frequency of HBsAg serologic screening;
-use of heptatitis B vaccine;
-incidence of non-A, non-B hepatitis among patients and staff;
-occurrence of pyrogenic reactions and septicemia (number of reactions and their occurrence in clusters);
-incidence and case fatality rate of dialysis dementia;
-occurrence of new dialyzer syndrome;
-incidence of hemolytic reactions;
-practices associated with reuse of dialyzers, dialyzer caps, bloodlines, and transducer filters;
-procedures for cleaning and disinfection;
-number of patients undergoing chronic dialysis known to have Human Immunodeficiency Virus (HIV) infection.

Questionnaires were returned by 1,350 of 1,520 centers, a response rate of 89 percent. These centers represented 87,505 patients and 25,044 staff members. All questionnaires were edited for accuracy and consistency of responses. When necessary, facilities were recontacted (approximately 300) for clarification of data. Data were analyzed with use of the chi square test and Fisher's exact test for differences in proportions. The Mentel-Haenszel combined odds ration was used when adjustment of confounding variables was required. A *p* value less than .05 was considered significant."

Please refer any questions or requests for this report to: Hepatitis Branch, Division of Viral Diseases, Nosocomial Infections Laboratory Branch, Hospital Infections Program, Center for Infectious Diseases, Centers for Disease Control, Atlanta, Georgia 30333.

Health Care Financing Administration grant activity summaries

The Health Care Financing Administration (HCFA) is presently involved in many research activities that deal with or touch on the end stage renal disease program. These activities range from internal HCFA reviews to full-scope extramural studies that are covered under the grant or cooperative agreement process.

Summaries of these activities follow.

End Stage Renal Disease

Design of a Demonstration and Assessment of Competitive Health Insurance Proposals in the End Stage Renal Disease Program

Project No.:	14-C-98275/3-03
Period:	March 1983–September 1987
Funding:	$ 1,472,772
Award:	Cooperative Agreement
Awardee:	The Urban Institute 2100 M Street, NW. Washington, D.C. 20037
Project Officer:	Marla Aron Division of Health Systems and Special Studies

Description: This project will determine the feasibility of demonstrations to test competitive financing approaches in the end stage renal disease (ESRD) program, with possibilities including:

- Competitive bidding.
- Global capitation covering all medical care costs.
- Partial capitation covering only outpatient ESRD services.
- Voucher payment allowing patients to share in the financial savings of cost-reducing shifts.

Status: During the second project period (May 1, 1985–April 29, 1986), The Urban Institute assisted the Office of Demonstrations and Evaluations in implementing a competitive bidding model. The competitive bidding demonstration started April 1, 1985. The Health Care Financing Administration (HCFA) selected Riverside, California, and Denver, Colorado, as demonstration sites. All independent and hospital-based providers of outpatient dialysis services in Riverside and Denver were asked to submit a bid, not to exceed the Medicare composite rate for independent facilities, for providing maintenance dialysis services to Medicare beneficiaries. An approved competitive bid would serve as the basis of Medicare reimbursement to that facility. Beneficiaries would receive a cash incentive payment equal to 70 percent of the difference between the composite rate for independent facilities and the bid rate of the facility. Any facility not submitting a bid, or submitting a bid higher than the composite rate, would receive its normal composite rate payment. The demonstration would test whether the potential for increased case loads would induce facilities to bid lower prices and whether cash incentives would induce beneficiaries to seek lower priced facilities. HCFA received no bids from Riverside. One facility in Denver bid $12 below the composite rate, but the facility withdrew from the demonstration in September 1985 because of the lack of patient transfers. During the final project period, The Urban Institute will prepare the following reports: an analysis that relates case-mix measures to cost, issues of patient and provider choice, quality of care, and a survey on access to transplantation.

Capitation Payment System for All End Stage Renal Disease Services

Project No.:	95-C-98497/9-02
Period:	January 1985–April 1991
Funding:	$ 424,426
Award:	Cooperative Agreement
Awardee:	El Camino Hospital District Corporation 2500 Grant Road Mountain View, Calif. 94042
Project Officer:	Bonnie Edington Division of Health Systems and Special Studies

Description: This project will develop and test a competitive capitation program under which capitation payments would cover all Medicare benefits to end stage renal disease (ESRD) patients, including transplants. A delivery system similar to a health maintenance organization (HMO), designated as a disease management organization, will be developed and will include case management for ESRD patients, patient incentives, physicians' incentives and risk taking, preferred provider contracts, and quality assurance systems.

Status: During the first 18 months, El Camino focused efforts in three major areas: refining a computerized model; collecting and analyzing area-specific data to determine the feasibility of negotiating a sub-State capitation rate; and obtaining exemption from State HMO licensure regulations in order to function as a demonstration project. Between July 1986 and August 1987, El Camino developed a detailed protocol specifying organizational structure and functions, risk-sharing and provider incentives for containing costs, marketing strategies, administrative operations, and a plan for evaluation. A continuation application has been submitted for the operational phase of this demonstration, which is expected to begin in 1988.

Learning From and Improving Diagnosis-Related Groups for End Stage Renal Disease Patients

Project No.:	14-C-98596/3-02
Period:	September 1984–May 1987
Funding:	$ 350,000
Award:	Cooperative Agreement
Awardee:	The Urban Institute Health Policy Center 2100 M Street, NW. Washington, D.C. 20037
Project Officer:	Paul W. Eggers Division of Beneficiary Studies

Description: The introduction of prospective payment by diagnosis-related groups has drastically altered the incentives in medical care. The purpose of this project is to study the responses of providers at the level of individual patients and diagnoses in end stage renal disease, an area on which abundant data are available. Specific issues to be addressed include the possibility of selection of diagnoses to maximize reimbursement, alteration of discharge and admission patterns and other forms of cost shifting, and the selection of patients for admission. Specifically, patients will be characterized in terms of major demographic and prognostic factors, including measures of severity of illness. Patterns of diagnostic categorization, admission patterns, and treatment costs will be compared for homogenous groups before and after the prospective payment system. The final report is expected in early 1988.

PROGRAM EFFICIENCIES, ANALYSES, AND REFINEMENTS

End Stage Renal Disease

End Stage Renal Disease Annual Report to Congress

Funding:	Intramural
Project Director:	Paul W. Eggers Division of Beneficiary Studies

Description: The Office of Research and Demonstrations (ORD) has the responsibility for producing three sections included in each year's Report to Congress (Public Law 95-292). These are: end stage renal disease (ESRD) patient morbidity, ESRD patient mortality, and ancillary hospital costs.

Status: ORD has produced the three sections above for the following reports:

- *1981 ESRD Annual Report to Congress,* HCFA Pub. No. 82-02144.
- *1982 ESRD Annual Report to Congress,* Medicare Annual Report, Fiscal Year 1981, HCFA Pub. No. 02156.
- *1983 ESRD Annual Report to Congress,* Medicare Annual Report, Fiscal Year 1983, HCFA Pub. No. 02157.
- *1984 ESRD Annual Report to Congress,* Medicare Annual Report, Fiscal Year 1983, HCFA Pub. No. 02157.
- *1985 ESRD Annual Report to Congress,* submitted for departmental approval.
- *1986 ESRD Annual Report to Congress,* in preparation.

Comparative Analysis of the Cost and Outcomes of Kidney Transplants

Project No.:	14-C-98564/0-03
Period:	July 1984–December 1987
Funding:	$ 1,146,683
Award:	Cooperative Agreement
Awardee:	Battelle Human Affairs Research Center 4000 NW., 41st Street Seattle, Wash. 98105
Project Officer:	Paul W. Eggers Division of Beneficiary Studies

Description: This is multicenter observational study of the impact of cyclosporine on renal transplantation. A sample of 396 patients contributed by five major centers experienced in the use of cyclosporine will be studied in depth. Detailed information on outcomes (mortality, complications, and disability) and costs will be collected on this sample and analyzed in terms of major prognostic factors. In addition, extensive data of a medical or biologic and of a sociologic nature will be obtained. The representativeness of the sample will be validated by comparison with the universe of patients treated with cyclosporine for whom more limited information is available in the Health Care Financing Administration Medical Information System data base.

Status: A collaboration with the scientific studies committee of the American Society of Transplant Surgeons was formalized, and a working group of physicians to advise and guide the biomedical component of the study was empaneled and met twice. The supplementary questionnaires designed to gather medical data were drafted and finalized after review by the medical working group. Patient selection criteria have been finalized. Participating transplant centers have been selected, and subcontracts for data acquisition have been negotiated. The second year of the project was devoted largely to data collection. Five transplant centers agreed to participate in the study: University of California, San Francisco; Ohio State University; University of Pittsburgh; University of Texas, Houston; and University of Wisconsin. Data collection was completed by July 1987. A final report is expected early 1988.

Waiver for the Northwest Kidney Center, Seattle, to be Reimbursed Directly for Providing Home Dialysis Training Services

Project No.:	95-C-98485/0-03
Period:	November 1984–October 1987
Award:	Cooperative Agreement
Awardee:	Northwest Kidney Center 700 Broadway Seattle, Wash. 98122
Project Officer:	Marla Aron Division of Health Systems and Special Studies

Description: The Northwest Kidney Center (NKC) is conducting a pilot test of a home dialysis training program. Under this program, NKC will provide home dialysis training services to 6-10 patients per year at the Central Washington Hospital in Wenatchee, and St. Peter Hospital in Olympia, Washington. NKC will provide training in the homes of one to two hepatitis B antigen positive patients per year. The home dialysis training will be provided for 2-3 weeks depending on the individual patient. Training will be on a 5-day-week basis with 3 weekly hemodialyses, or continuously in the case of continuous ambulatory peritoneal dialysis. The goal is to show that a regionalized home dialysis training program will increase the number of patients choosing to dialyze at home.

Status: During the third project year, the demonstration population could include patients who carry the human t-cell lymphotropic virus type-III antibody. The Olympia Peninsula Kidney Center withdrew from the demonstration during the second year after hiring a home dialysis training nurse.

Comparison of Quality of Life of End Stage Renal Disease Patients

Project No.:	14-C-98642/5-02
Period:	September 1984–September 1986
Funding:	$ 102,976
Award:	Cooperative Agreement
Awardee:	University of Minnesota Family Study Center 1114 Social Sciences Minneapolis, Minn. 55455
Project Officer:	Paul W. Eggers Division of Beneficiary Studies

Description: The objective of this study is to evaluate the quality of life of patients on different therapeutic regimens for end stage renal disease. The following groups will be compared:

- Transplant recipients randomly allocated to conventional immunosuppression.

- Transplant recipients randomly allocated to immunosuppression with cyclosporine.
- Patients on center hemodialysis.
- Patients on continuous ambulatory peritoneal dialysis.
- A historical control of patients who received transplants in 1970–73.

Clear-cut differences in survival do not necessarily distinguish among the above treatment modalities. Comparative quality of life is, therefore, an important criterion.

Status: Information was collected on 83 center hemodialysis patients, 510 continuous ambulatory peritonical dialysis (CAPD) patients, and 91 transplant recipients (40 receiving conventional immunosuppressive therapy and 51 cyclosporine). There are pronounced differences in objective measures of rehabilitation. More than 80 percent of male transplant recipients with functioning grafts work or are in school at least part time (a proportion that is consistent with that seen nationally), but only 30 percent of male center hemodialysis patients have achieved an equal level of rehabilitation. Of the male CAPD patients, 46 percent work or attend school at least part-time. Patterns among female patients are similar, but less pronounced. Transplant patients also have the best subjective sense of well-being, but the differences are smaller in magnitude. Transplant patients who received cyclosporine score consistently higher on measures of well-being than those on conventional therapies, in part because of the lower incidence of rejection episodes and of complications of steroid therapy. Three articles were written under this cooperative agreement:

- ''Quality of life after kidney transplantation: A prospective, randomized comparison of cyclosporine and conventional immunosuppressive therapy,'' to be published in *Transplantation.*
- ''Rehabilitation after kidney transplantation,'' in *Organ Transplantation and Replacement,* Cerilli, J., ed., to be published by J.B. Lippincott.
- ''Ethics in organ transplantation,'' in *Organ Transplantation and Replacement,* Cerilli, J., ed., to be published by J.B. Lippincott.

A final report has been accepted and a submission is being prepared for the National Technical Information Service.

Severity of Illness in End Stage Renal Disease Population in Northern Florida

Project No.:	14-C-98696/4-02
Period:	September 1984–December 1986
Funding:	$ 509,356
Award:	Cooperative Agreement
Awardee:	University af Florida Grinter Hall Gainesville, Fla. 32610
Project Officer:	Paul W. Eggers Division of Beneficiary Studies

Description: The purpose of this study is to develop and test measures of severity of illness that predict resource consumption levels in the end stage renal disease (ESRD) program. These measures will he based on the acute physiology and chronic health evaluation (APACHE) system, which was developed to measure therapeutic effort and resource costs in intensive care units. Two components of APACHE, the therapeutic intervention scoring system (TISS) and the acute physiology score (APS), will be adapted to the special characteristics of the ESRD patient receiving dialysis. TISS and APS will then be used to measure ESRD case mix and resource consumption.

Status: The major activity of the first year of this study involved the development of an instrument to measure severity of illness variations in the chronic hemodialysis population. The instrument includes physiologic measures, dialysis treatment variations, measures of comorbidities, as well as socioeconomic and behavioral factors. Final revisions to the instrument were made in June 1985, based on comments from a technical advisory panel and reviews of patients' charts in ESRD facilities to determine data availability. Seven hemodialysis units have agreed to participate in the study. The number of patients to be included will be approximately 560. Data collection began in Fall 1985. Second-year activities mainly involved data collection. The final phase of the project involves developing scaling and weighting indices for both patient severity and resource comsumption. A final report is expected in early 1988.

End Stage Renal Disease Nutritional Therapy Study

Period:	September 1984–August 1993
Award:	Interagency Agreement
Agency:	National Institute of Diabetes and Digestive and Kidney Disease
Project Officer:	Bonnie Edington Division of Health Systems and Special Studies

Description: In accordance with the congressional mandate (Public Law 96-499), this Study, known as the Modification of Diet in Renal Disease Study, seeks to determine the extent to which the commencement of nutritional therapy in early renal disease (limiting protein and providing nutritional supplements) can retard or arrest the progression of the disease, resulting in substantive deferment of dialysis, and the administrative, financial, and other aspects of making nutritional therapy generally available under Medicare. The study is being conducted jointly by the National Institutes of Health and the Health Care Financing Administration (HCFA). Initiation of full-scale clinical trials will be preceded by a developmental phase and a pilot test.

Status: Phase I, the developmental phase, began in September 1984 and concluded in December 1985. This phase produced a clinical protocol, forms manual, and operation manual. Phase II, a 2-year pilot study, began in January 1986 at nine clinical sites: Harbor General Hospital, University of California at Los Angeles Medical Center, Los Angeles, California; University of Southern California School of Medicine, Los Angeles

County Hospital, Los Angeles, California; Johns Hopkins University Hospital, Baltimore, Maryland; New England Medical Center, Boston, Massachusetts; Brigham and Women's Hospital, Boston, Massachusetts; Beth Israel Hospital, Boston, Massachusetts; Massachusetts General Hospital, Boston, Massachusetts; Vanderbilt University Medical Center, Nashville, Tennessee; and University of Iowa, Hospitals and Clinics, Iowa City, Iowa. Patients within a specific range in level of kidney function are being screened, and only those manifesting a specific minimum in the rate of disease progression (decline in kidney function) enter the 3-month baseline period. Following baseline, patients are divided into two groups, based on their level of kidney function, and, within each group, randomly assigned to one of three nutritional therapy regimens. It is hoped that at least 108 patients (12 at each site) will complete at least 18 months of nutritional therapy. After the 2-year pilot study concludes in December 1987, a third phase of the study is expected to begin. This would be a 3-to-5 year full clinical trial involving 600 to 900 patients. At the conclusion of that phase, a 1-year analysis of cost effectiveness would be undertaken by HCFA.

Relative Effectiveness and Cost of Transplantation and Dialysis in End Stage Renal Disease

Project No.: 14-C-98372/5-04
Period: September 1983–September 1988
Funding: $ 1,566,292
Award: Cooperative Agreement
Awardee: University of Michigan
Department of Epidemiology
109 Observatory Street
Ann Arbor, Mich. 48109
Project Officer: Carl Josephson
Division of Program Studies

Description: This study will perform a comprehensive assessment of the cost effectiveness of end stage renal disease treatment under different treatment modalities, an assessment of the impact of cyclosporine on transplant success, and a life-table analysis of risk factors for patient and graft survival. The study will use data from the Michigan Kidney Registry, supplemented by survey information and medical record abstractions. Because of the design of the study, it is anticipated that the project will demonstrate the utility of a longitudinal, patient-specific data system for policy decisionmaking at the Federal level.

Status: The awardee has made significant progress in all phases of this project. The basic research design is a phased cohort analysis of renal patients entering treatment modalities over two periods, 1981–83 and 1984–86. Analysis of the data from the second cohort is being performed in the three main research areas: quality of life, survival, and cost effectiveness. Additionally, progress continues in the secondary goals of the research project, such as identifying diabetic etiological factors in end stage renal disease, using the Michigan Kidney Registry data for a variety of research purposes, and studying the relationship between immunosuppressive agents and malignant tumors.

Cause and Failure to Transplant Cadaveric Human Organs

Project No.: 17-C-98728/1-01
Period: August 1986–July 1989
Funding: $ 559,740
Award: Cooperative Agreement
Awardee: Brandeis University
415 South Street
Waltham, Mass. 02254
Project Officer: Paul W. Eggers
Division of Beneficiary Studies

Description: The project will determine the reasons for the high rate (19.6 percent) of wastage of cadaveric kidneys in the United States and make recommendations to reduce this loss in the future. Many studies have shown that kidney transplantation is beneficial both clinically and from a cost perspective. The major barrier to increased transplantation is organ availability. This study, through its measure of determinants of, and cures for, cadaver organ wastage, could help increase the efficiency of the organ procurement system. A second part of the project, funded by the Public Health Service through an interagency agreement, is an analysis of the status, efficiency, and effectiveness of the organ procurement system in the United States. This part is congressionally mandated under Section 375 of the Public Health Service Act, as added by Public Law 98-507 of the National Organ Transplant Act.

Status: A preliminary analysis of the status of organ procurement in 1986 has been completed and delivered to the Public Health Service. This includes descriptive analyses such as size and volume of activity, donor characteristics, organization structure, personnel, and measures of efficiency. The second phase of the study will entail the tracking of kidneys from harvest through transplantation or inability to place (i.e., wastage). This will enable accurate estimates to be made of true wastage rates.

Impact of Payment Changes on Medicare: Case of End Stage Renal Disease (ESRD)

Project No.: 17-C-99021/3-01
Period: June 1987–June 1989
Funding: $500,000
Award: Cooperative Agreement
Awardee: Philip Held
The Urban Institute
2100 M Street, NW.
Washington, D.C. 20037
Project Officer: Joel H. Broida
Division of Program Studies

Description: This project is part of an ongoing effort to monitor several components of Medicare's ESRD program. The major thrust of this project will be to measure the impact of two recent reductions in the composite payment rate on access to and quality of care provided to ESRD patients. Information for this study will be derived from summaries of medical care records and other supplementary sources for past patients in both hospital-based and freestanding dialysis centers. The initial effort will concentrate on an assessment of the impact of the $12 reduction of the composite rate in 1983. This will include analysis of morbidity and mortality associated with ESRD in concert with the study mandated by Congress. This aspect was specified in Section 9335(b)(2) of the Omnibus Budget Reconciliation Act of 1986. As soon as the data becomes available, the same protocol will be followed to measure the impact of the additional $2 composite rate reduction instituted in 1986. Another issue under study in this project is the impact of dialyzer reuse on patient mortality, morbidity, and kidney transplantation, which is part of the Health Care Financing Administration's ongoing interest in measuring and tracking ESRD patient outcomes.

Status: An interim report to Congress is expected to be available before January 1, 1988, and the final report is expected to be completed during Summer 1988.

Appendix A

Glossary of terms

Access device—A piece of equipment or a mechanism designed for access to the patient's bloodstream (for hemodialysis) or to the peritoneal membrane (for peritoneal dialysis).

Agreement—A written document executed between an ESRD facility and another facility in which the other facility agrees to assume responsibility for furnishing specified services to patients and for obtaining reimbursement for those services.

Arrangement—A written document executed between an ESRD facility and another facility in which the other facility agrees to furnish specified services to patients but the ESRD facility retains responsibility for those services and for obtaining reimbursement for them.

Backup dialysis—A dialysis session furnished to an ESRD patient which is outside the patient's routine dialysis setting, e.g., a home patient dialyzing in the facility or an in-facility patient transferred to a back-up facility.

Backup hospital—A hospital with whom a dialysis facility has a written agreement under which inpatient hospital care or other hospital services are available promptly to the dialysis facility's patients when needed.

Beneficiary—One who is entitled to have Medicare benefits paid on his behalf.

Continuous ambulatory peritoneal dialysis(CAPD)—A type of peritoneal dialysis whereby the patient dialyzes at home, using special supplies, but without the need for a machine.

Cadaveric transplant—The surgical procedure of excising a kidney from a cadaver and implanting it into a suitable recipient.

Chronic maintenance dialysis—Dialysis which is regularly furnished to an ESRD patient in either a hospital-based, independent (non-hospital based), or home setting.

Continuous cycling peritoneal dialysis (CCPD)—A variant of CAPD in which a machine is used to make exchanges at night automatically.

Dialysis—A process of maintaining the chemical balance of the blood when the kidneys have failed; specifically a process by which dissolved substances are removed from a patient's body by diffussion from one fluid compartment to another across a semi-permeable membrane. The types of dialysis currently used are hemodialysis, peritoneal dialysis, continuous ambulatory peritoneal dialysis (CAPD), and continuous cycling peritoneal dialysis (CCPD).

Dialysis center—A hospital unit which is approved to furnish the full spectrum of diagnostic, therapeutic, and rehabilitative services required for the care of ESRD dialysis patients (including inpatient dialysis) furnished directly or under arrangement.

Dialysis facility—A unit (hospital-based or freestanding) which is approved to furnish dialysis service(s) directly to ESRD patients.

Dialysis station—The treatment area which is designed and equipped to provide adequate and safe dialysis therapy, as well as privacy and comfort for patients.

Dialysis treatments—The number of treatments performed for ESRD patients.

Disposition of cadaveric kidneys—The final disposition of acquired cadaveric kidneys.

End-stage renal disease (ESRD)—That stage of renal impairment which is irreversible and permanent and requires dialysis or kidney transplantation to ameliorate uremic symptoms and maintain life.

ESRD facility—A supplier of health care services that is approved to furnish at least one specific ESRD service.

ESRD network—An approved organized group of ESRD providers in a designated area which, by their type and location and because of local referral patterns, collectively furnish the necessary care for ESRD patients in the population served.

ESRD Medicare beneficiary—A person qualifying for Medicare by means of the renal disease provision of the law and eligible for the full range of benefits available under the health insurance program, not just for those services relating to renal care.

ESRD patient—A person with irreversible and permanent kidney failure.

ESRD service—Treatment or care (e.g., dialysis, transplantation, supplies) usually rendered to those diagnosed as having ESRD.

Eligibility requirements—To qualify for Medicare under the renal provision a person must have end-stage renal disease and either: be entitled to a monthly insurance benefit under Title II of the Social Security Act (or an annuity under the Railroad Retirement Act); or be fully or currently insured under Social Security (railroad work may count); or be the spouse or dependent child of a person who meets at least one of these last two requirements. There is no minimum age for eligibility under the renal disease provision. An application for Medicare must be filed (effective October 1, 1978).

Enrolled/entitled—An individual who has filed an enrollment request and meets all other eligibility requirements for Medicare can then elect to be enrolled in Part A (hospital insurance) and/or Part B (supplemental medical insurance) of the Medicare program.

Hemodialysis—A method of dialysis in which blood from a patient's body is circulated through an external device or machine and thence returned to the patient's bloodstream. Such an artificial kidney machine usually is designed to remove fluids and metabolic end products from the bloodstream by placing the blood in contact with a semi-permeable membrane which is bathed on the other side by an appropriate chemical solution referred to as dialysate.

Home patients—Those patients who maintain their own dialysis equipment at home and perform their own treatment alone or with the assistance of a helper. These are medically-able patients who perform dialysis at home after being trained.

Inpatient care only—A renal dialysis center which performs backup services for dialysis facilities and performs 20 percent or less of its dialysis on an outpatient basis.

Inpatient dialysis—Dialysis which, because of medical necessity, is furnished to an ESRD patient on a temporary inpatient basis in a hospital.

In-unit (in-facility) patients—Those patients whose dialysis is performed in a dialysis unit or facility, or who dialyze themselves in a unit or facility.

Living related donor transplant—The surgical procedure of excising a kidney from a living relative of the patient and implanting it in the patient.

Lost to follow-up (LTFU)—A category of patients whose current status is unknown to the facility which at one time had been dialyzing/following the patient.

Number of dialysis treatments given (other than home)—The number of times dialysis machines were used to provide patient treatments.

Number of centers by number of transplants—The number of centers performing a specified number of transplants for the survey period.

Number of facilities/centers surveyed—The number of individual facilities/centers completing the ESRD Facility Survey form.

Number of patients completing self-dialysis training course—The number of patients who have completed a certified training program teaching them to perform their own renal dialysis treatments in the home or on an outpatient basis alone or with the assistance of a helper.

Organ procurement—The process of acquiring donor kidneys.

Organ Procurement Agency (OPA)—An organization which performs or coordinates the performance of all the following services: harvesting of donated kidneys; preservation of donated kidneys; transportation of donated kidneys; and maintenance of a system to locate prospective recipients for harvested organs.

Patients awaiting transplant—The number of patients dialyzing at or being followed by a facility who are medically able to receive a transplant, have given consent for a transplant, and are on an active transplant list.

Patients completing self-dialysis training course—Patients who have completed a certified training program teaching them to perform their own renal dialysis treatments in the home or on an outpatient basis alone or with the assistance of a helper.

Peritoneal dialysis—A procedure that introduces dialysate into the abdominal cavity to remove waste products through the peritoneum (a membrane which surrounds the intestines and other organs in the abdominal cavity). It functions in a manner similar to that of the (artificial) semi-permeable membrane in the hemodialysis machine. Two other forms of peritoneal dialysis are continuous ambulatory peritoneal dialysis, and continuous cycling peritoneal dialysis.

Provider number—An assigned Medicare identification number for billing which consists of six positions. The first two positions represent a State code. The third and fourth positions represent the type of provider of services. For renal providers, the coding is as follows: 0 in 3rd position = short-stay hospital; 20 in 3rd and 4th positions = long-term care hospital; 25 or 26 in 3rd and 4th positions = independent renal facilities; 33 in 3rd and 4th positions = pediatric (children's) hospital; and 35 in 3rd and 4th positions = hospital satellite renal facility (hospital satellites are owned and operated by hospitals).
For example: 01 0001 = hospital in Alabama; 05 2500 = independent in California; and 14 3500 = hospital satellite in Illinois.

Program management and medical information system (PMMIS)—A system which contains, in part, medical information on patients and the services that they have received during the course of their therapy. The ESRD PMMIS is an automated system of medical records that deals primarily with current Medicare eligible ESRD patients but also maintains historical information on persons no longer classified as ESRD patients by reason of death or successful transplantation. In addition, it contains information on ESRD facilities and facility reimbursement.

Receiving service—Includes all patients who receive either kidney dialysis or kidney transplant services.

Renal dialysis center—A hospital unit approved to furnish the full spectrum of diagnostic, therapeutic (including patient dialysis furnished directly or under arrangement) and rehabilitative services, except renal transplantation, for the care of ESRD dialysis patients.

Renal dialysis facility—A unit (hospital-based or free-standing) that is approved to furnish dialysis services to ESRD patients.

Renal network—An approved organized group of ESRD facilities in a designated area which, by their type and location and because of local referral patterns, collectively furnish the necessary care for ESRD patients in the population served.

Renal transplant center—A hospital unit which is approved to furnish direct transplantation and other medical and surgical specialty services for the care of the ESRD transplant patients, including inpatient dialysis furnished directly or under arrangement.

Restarted dialysis—A category of ESRD patients who, at one time, were on chronic maintenance dialysis, left that treatment category for reasons other than a transplant (e.g., recovered kidney function), then returned to dialysis.

Self-care services—A service provided by a dialysis facility or center where patients who have been trained to perform self-dialysis with little or no professional assistance dialyze.

Self-dialysis—Dialysis performed with little or no professional assistance by an ESRD patient who has completed an appropriate course of training.

Self-dialysis patients—Patients who have been trained in dialysis techniques and dialyze themselves in a dialysis facility or at home without professional assistance. Patients who are entirely responsible for administering their own dialysis treatments without professional support (except in emergency situations) are in this category.

Self-dialysis training and home training—Programs that train ESRD patients to perform self-dialysis or home dialysis with little or no professional assistance and train other individuals to assist patients in performing self-dialysis or home dialysis.

Special purpose facility—A renal dialysis facility which is approved to furnish dialysis at special locations on a short-term basis to a group of dialysis patients otherwise unable to obtain treatment in the geographical area. The special locations must be either special rehabilitative (including vacation) locations servicing ESRD patients temporarily residing there, or locations in need of ESRD facilities under emergency circumstances.

Staff-assisted dialysis—Dialysis performed by the staff of the renal dialysis center or facility.

Started for first time ever—A category of ESRD patients who have been newly diagnosed as having ESRD, and have begun chronic maintenance dialysis; or, newly diagnosed ESRD patients who, after being stabilized on dialysis, completed a course of self-dialysis training and have begun dialyzing at home or self-dialyzing at a facility.

Survey period—The period January 1 through December 31 of each year for which all ESRD facilities must complete form HCFA-2744, ESRD Facility Survey.

Training services—A program that trains ESRD patients to perform self-dialysis or home dialysis with little or no professional assistance, and trains other individuals to assist patients in performing self-dialysis or home dialysis.

Transient patients—Patients who are treated by facilities episodically (less than 51 percent of the survey period); e.g., vacationers.

Transplant—The surgical procedure that involves excising an organ from either a cadaver or from a living donor and implanting it in the patient.

Transplant center—A hospital unit which is approved to furnish direct transplantation and other medical and surgical specialty services for the care of the ESRD transplant patients, including inpatient dialysis furnished directly or under arrangement.

Transplants performed—The number of kidneys transplanted by donor source type; i.e., living-related or cadaveric.

Treatment setting—The type and location of the dialysis treatment being performed; i.e., self-dialysis (in-unit or home), self-dialysis training, or staff-assisted dialysis.

Appendix B
Entitlement provisions

The Social Security Amendments of 1972 extended Medicare coverage to individuals with end-stage renal disease beginning July 1973, the month the law became effective. End-stage renal disease is that stage of kidney impairment which is irreversible, cannot be controlled by conservative management alone, and requires dialysis or kidney transplantation to maintain life.

As soon as an individual knows that he needs maintenance dialysis treatments, he should apply for Medicare at any social security office. Social security representatives will help the applicant furnish all necessary information and answer questions he may have about the Medicare program. One of the essential forms to be completed will be a HCFA-2728, Chronic Renal Disease Medical Evidence Report. Notification of entitlement will be mailed later. If a person cannot come to the social security office, arrangements can be made so that a representative can visit the person to take an application.

When entitlement to hospital insurance (Part A) is established, the individual is automatically enrolled for supplementary medical insurance (Part B) to begin the same month, unless he specifies he does not want this coverage.

It is not in the best interest of most persons with end-stage renal disease to decline Part B coverage because many renal services, such as outpatient dialysis treatments, are covered only under Part B. A person qualifying for Medicare by means of the renal disease provision is eligible for the full range of benefits available under the health insurance program, not just for those services relating to renal care.

Nature of 1978 amendments

The Social Security Amendments of 1978 made a number of changes in the rules governing entitlement to Medicare based on end-stage renal disease. The changes were designed to encourage self-dialysis and transplantation surgery and to eliminate a number of inequities and difficulties that existed under previous law. These changes which were effective October 1, 1978 follow:

- Age 65 restriction removed—Prior to October 1, 1978, persons 65 years of age or over were ineligible for Medicare based on end-stage renal disease. This restriction has been eliminated.
- Application requirement—On claims for entitlement beginning October 1, 1978 and later, an application must be filed, with retroactivity limited to no more than 12 months before the month of filing.
- Early entitlement based on hospitalization for transplant surgery—Entitlement may begin during a month in the qualifying period if during that period the individual is hospitalized for transplant procedures, and the transplant takes place no later than 2 months thereafter.
- Waiver of qualifying period based on self-dialysis training—The qualifying period is waived for persons who during the qualifying period participate in self-dialysis training and are expected to complete the training successfully and self-dialyze thereafter.
- 36 months of post-transplant entitlement—Entitlement terminates 36 months (rather than 12 months, as under previous law) after the month in which an individual undergoes kidney transplantation.
- No second qualifying period after termination of R-HI (health insurance based on entitlement because of renal provisions of the law)—An individual whose entitlement to Medicare on the basis of ESRD has ended will be reentitled as of the month his new course of dialysis begins, subject to the filing of a timely application.

Requirements for eligibility

To qualify for Medicare under the renal provision a person must have end-stage renal disease and either: be entitled to a monthly insurance benefit under Title II of the Social Security Act (or an annuity under the Railroad Retirement Act); or be fully or currently insured under Social Security (railroad work may count); or be the spouse or dependent child of a person who meets at least one of these last two requirements. There is no minimum age for eligibility under the renal disease provision. An application for Medicare must be filed (effective October 1, 1978).

When entitlement begins

Provided all eligibility requirements are met, a person's Medicare entitlement based on the renal provision of the law begins with one of four occurrences.

- The third month after the month in which a course of dialysis is initiated. For example, if a course was initiated any time during the month of January, the date of entitlement would be April 1 (Table B-1).
- If earlier, the month a course of maintenance dialysis begins if the individual participates within the waiting period in a self-dialysis training program in an approved facility and is expected to complete the training successfully and self-dialyze thereafter (effective October 1, 1978).
- If earlier, the month of transplant.
- If earlier, the month an individual is admitted to an approved hospital for procedures preliminary to a transplant, if the transplant takes place within the following 2 months. If the transplant is delayed more than 2 months, Medicare coverage will begin the second month prior to the month the actual transplant takes place, or if earlier, the first day of the third month after maintenance dialysis began (effective October 1, 1978).

When entitlement ends

A person's entitlement to this protection terminates with the earliest of the following events:

- The day of death; or
- The last day of the 12th month after a person no longer requires maintenance dialysis treatments; or
- The last day of the 36th month after the month in which the individual receives a kidney transplant. If within 36 months after transplantation the person requires another transplant or returns to dialysis, there is no interruption in entitlement (effective October 1, 1978).

Table B-1
Effective date chart for patients applying for ESRD benefits

Regular course of dialysis initiated	Date of entitlement
January	April 1
February	May 1
March	June 1
April	July 1
May	August 1
June	September 1
July	October 1
August	November 1
September	December 1
October	January 1
November	February 1
December	March 1

Appendix C

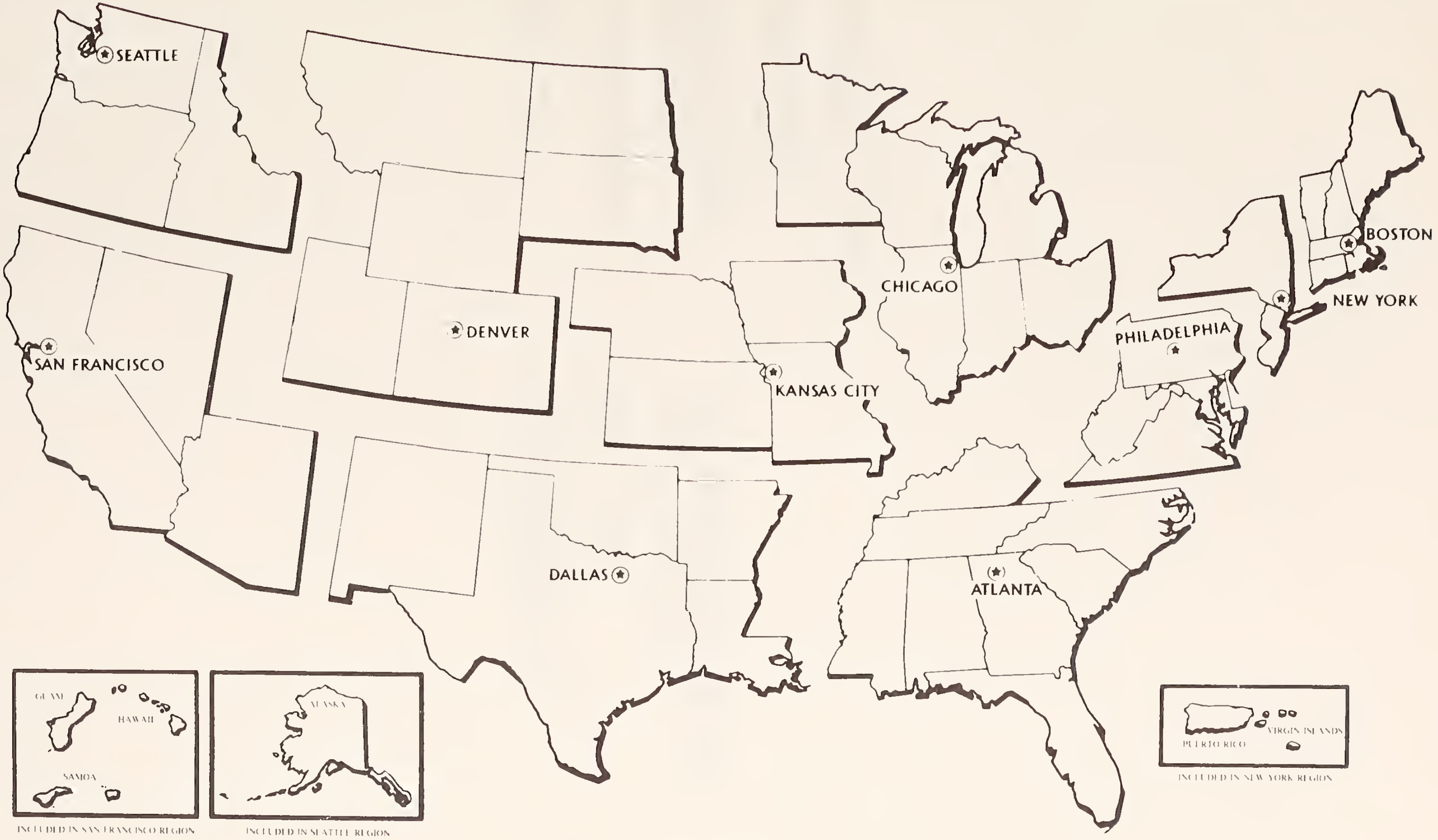
End stage renal disease (ESRD) data sources

Form title and number	Primary purpose	PMMIS function	Research potential
Outpatient Bill (HCFA-1483)	Billing	Dialysis incidence	Prevalence and outcome analyses.
Outpatient Service (UB-2)	Billing	Dialysis incidence	Prevalence and outcome analyses.
Inpatient Bill (HCFA-1453)	Billing	Inpatient stay diagnosis	Morbidity.
Inpatient Service (UB-2)	Billing	Inpatient stay diagnosis	Morbidity.
ESRD Transplant Information (HCFA-2745-U4)	Clinical information	Transplant incidence	Clinical research: Efficacy of treatment and prevalence and outcome analyses.
ESRD Transplant Followup (no number)	Clinical rehabilitative information	Patient and graft survival and rehabilitation	Clinical research: Efficacy of treatment and outcome analyses
ESRD Death Notification (HCFA-2746)	Death incidence	Death incidence, cause of death	Outcome analyses.
CRD Medical Evidence Report (HCFA-2728-U4)	Entitlement	Identification of primary disease and first date of treatment	Incidence and outcome analyses.
ESRD Facility Survey (HCFA-2744)	Number of Medicare and non-Medicare patients by modality	National overview of Medicare and non-Medicare patients by modality	Incidence, prevalence and outcome analyses.

NOTES: PMMIS is Program Management and Medical Information System. HCFA is Health Care Financing Administration. CRD is chronic renal disease. UB is uniform bill.

APPENDIX D

HEALTH CARE FINANCING ADMINISTRATION
REGIONAL OFFICE BOUNDARIES



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☆U.S. Government Printing Office: 1989 — 508-529

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HCFA Pub. No. 03268 December 1988